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An Address.[1]

By LESLIE E. LE SOUEF, O.B.E., E.D., M.D., F.R.C.S., F.R.A.C.S.,

Retiring President, Western Australian Branch, British Medical Association, Perth.

ON this the last occasion on which I shall fill the presidential chair in this year of office I wish to express my appreciation of the honour you have done me, both in 1940 and in 1946. In 1940, as a result of the war, it became impossible for me to do more than commence my year of office, and I am deeply indebted to those who carried on in my absence.

That you should have seen fit to ask me to fill this high office immediately on my return from overseas service has been of great moment to me. Arriving home after a period of about seven years, during which I was away from council duties, it appeared clear to me that I could accede to the request only if the council members were willing to assist me, at least in the first few months, to obtain the information and background necessary. In retrospect I realize my indebtedness to my colleagues for their help and encouragement, and at the same time desire to pay testimony to the outstanding work they have done. Our relationships have been most cordial and much ground has been covered.

With the passing of 1946 it is essential that we pause and review the past in order that we may prepare the more diligently for the future. Eighteen months have now elapsed since the Japanese, imitative as ever, joined their arrogant allies the Germans in abject surrender to the United Nations. One might be forgiven if one had expected the fruits of such a great victory to come quickly. But what do we find? As the tumult of war recedes, strange rumblings and disturbances occur to add to our disquiet. Our beloved Motherland, tried and tested in war in a manner never before seen in history, has emerged as perhaps the greatest moral force yet seen; and yet in the hour of her victory she is almost more sorely tried in peace than in war. One has but to open the daily paper to realize that post-war conflicts are ravaging the world in a manner almost beyond comprehension. With the passing of the Nazi menace we find, and let us thank God for it, a closer and closer union of the great western democracies in the face of another totalitarian threat to their existence thrusting towards the west.

Never before was it more imperative that every citizen should have a clear and accurate assessment of what, for want of a better term, I shall call moral values. The ordinary citizen can be stripped of things material by unscrupulous (or even honest) governments; but the moment that he is stripped of things spiritual, then the nation of which he is a representative does not deserve to survive. This is simply because it has lost the right to its own self-respect. Let us hope that the Government of Australia today will not forget this in its attitude to and dealings with not only the citizens comprising what we hope is and will continue to be a great Commonwealth, but also those of other countries beyond our shores. It is a fact that cannot be gainsaid that Australia, or for that matter any country, is judged in the eyes of all other nations by the acts and utterances of her leaders. John Citizen can alter the opinion formed about his country, and so about himself, by the outside world only by the power of his vote. It must be remembered that John Citizen acting alone cannot influence the world to think better or worse of him. It is only when he and his colleagues show a united front that the utterances and acts of his leaders can be influenced.

In the same way that international upheavals are shaking the world in general, so intranational upheavals are shaking all countries—not least Australia, despite the fact that apart from war alarms she was untouched by the invader. Thus it is that one sees great social trends and experiments in all countries. Sometimes one wonders whether one is witnessing evolution or revolution. At the

[1] Read at the annual meeting of the Western Australian Branch of the British Medical Association on March 19, 1947.

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moment the trend of socialization would appear to be world-wide, and this trend is certainly profoundly modifying our own interior economy. This in itself is not necessarily a bad thing if it is wisely controlled. In view of the Government's policy of ever expanding the social services within the Commonwealth, it is only natural that a policy offering free medical attention to all citizens should be of vital concern to the medical profession and all ancillary services.

The Government might claim, by its interpretation of the results of the referendum which it organized and held at the time of the recent elections, that in all its acts it was only keeping faith with the public of Australia. Would this claim be fair when one recalled its attitude towards the profession on which it has to depend to implement its free medical scheme for Australia? It is not desired to go into details concerning the Government's attitude towards the practising medical profession; but suffice it to note that for all practical purposes it has, until the advent of the new Federal Minister for Health, ignored the medical profession.

The medical profession, until the advent of this Minister, was faced, in this democratic country, with the interesting position that it was to be called on to give a national service of free medical treatment by the Government and was not even given the right or opportunity of advising the Government on how best to implement such a policy.

The members of the public were to be appeased, the medical profession was to be regimented and dragooned into serving them. It might be cynically said that such a governmental attitude—and attitude it was some months ago—was in keeping with the turbulent times through which we were passing. With the advent of the new Minister for Health, however, it became apparent that the practising members of the medical profession at last stood their chance of recognition as a body worthy of the most serious consideration in the building of the new social and medical structure of the Commonwealth. It is to be hoped that this relationship will be fostered to the national as well as to individual advantage.

Let the Government realize that the medical profession has ideals. Let both the Government and the medical profession appreciate that, in a world in which moral values are esteemed, only good can result from the actions and deliberations of the medical profession.

In order to give the Federal Council of the British Medical Association in Australia the best opportunity of leading, let us be united behind it, so that whatever negotiations may occur in the future, the council will derive strength from the knowledge that we, the rank and file, having formulated our policy and transmitted it to the council, have given our sympathetic and steadfast support.

Let our appreciation of moral values be such that it will continue not only to influence ourselves in our every act and thought towards the great changes around us, but also will bring an appreciation of the position, both practical and spiritual, to the Government concerned.

Let us face the new and changing world with confidence born of knowledge that we do so with ideals untarnished and honour unsullied.

HISTAMINE AND PHOSGENE POISONING.[1]

By E. R. TRETHEWIE,

From the Department of Physiology, University of Melbourne.

IN an earlier paper it was shown that histamine was liberated from the isolated perfused lung of the guinea-pig by phosgene, and that the mortality of this animal was lowered by thymoxyethyldiethylamine (Trethewie[3]). This paper deals with the demonstration of the liberation of another substance from the isolated lung and also extends the work concerning histamine liberation to the dog and the monkey, and to treatment with iron, vitamin *C* and manganese.

[1] Submitted to the Chemical Defence Board, Australia, on July 4, 1944. Released for publication on February 24, 1947.

METHOD.

Lung Perfusion.

The lung of the guinea-pig, monkey and dog was perfused and ventilated as described previously (Trethewie[3]). The guinea-pig was stunned by a light blow on the head. The dog was injected with morphine and then given chloralose intravenously. One monkey was killed by an electric current and the other was given morphine and chloralose. The phosgene container was placed in a shallow bath at 37° C. Phosgene exposures were for one minute, and the amount was calculated by weight. In the case of the dog the upper lobe of one side only was used; but in the case of the other animals one entire lung was perfused. Perfusate was collected prior to exposure, and successively 0 to 10, 10 to 30 and 30 to 60 minutes and then hourly after exposure. Histamine concentrations were estimated on boiled samples.

Rabbit Assay.

One millilitre of trypan blue (1%) was injected into the ear vein of a rabbit, and this procedure was followed by the intracutaneous injection of samples of perfusion fluid into the epilated skin of the body. Evidence for the presence of a capillary damaging factor is shown by the passage of blue dye into the skin at the site of the injection.

Isolated Jejunum of the Guinea-Pig.

Histamine was assayed on the jejunum of the guinea-pig suspended in a six-millilitre bath of Tyrode.

Treatment with Iron, Ascorbic Acid and Manganese.

Guinea-pigs and mice were exposed to phosgene in cages divided into four compartments: one guinea-pig or two mice were placed in each compartment; one mouse of each pair was treated and the other untreated, and adjacent guinea-pigs were similarly dealt with. The amount of phosgene was estimated as chloride by Miss L. Hunt (M.S.L.), and used in a one cubic metre chamber.

RESULT.

The Liberation of Histamine from the Isolated Lung of the Dog.

The lung of the dog can be perfused for four hours with Tyrode without histamine appearing in the fluid obtained from the pulmonary vein, if the dog has previously been given only morphine and chloralose (Kellaway and Trethewie[4]). The lungs of two dogs, weighing 7·7 kilograms and 10·0 kilograms respectively, were ventilated with phosgene (*c.t.*[1] 9,500 and 8,500) and histamine was liberated. In the one experiment 46γ of histamine were liberated during three hours' perfusion, and in the latter 32·7γ were liberated in six hours after exposure. The finding in this latter experiment is shown graphically in Figure I (middle line). It is seen that no histamine was liberated for ten minutes after ventilation with phosgene; then histamine appeared. The maximum initial output appeared during the third hour of perfusion, and a later rise occurred during the sixth hour. This is in agreement with the findings in the guinea-pig experiment, except that with this high *c.t.* histamine is found in the first sample after ventilation with phosgene. The amount liberated is much greater in the case of the dog, as is seen in Figure I. The output in the case of a guinea-pig lung (*c.t.* 7,000) is shown in Figure I (lowest line), the ordinate reading: "Output of Histamine in γ/min."

The Liberation of Histamine from the Isolated Lung of the Monkey.

When the lung of the monkey (*Macacus rhesus*), which was already dead, was perfused, histamine was found in the perfusion fluid before the lung was ventilated with phosgene (*c.t.* 9,500). It contained 0·3γ of histamine per millilitre. Immediately after exposure to phosgene the histamine output increased twelve times, the fluid containing 4γ of histamine per millilitre for ten minutes. During

[1] *c.t.* = milligrammes per cubic metre × time in minutes.

the next twenty minutes the histamine content of perfusate fell to 2·0γ per millilitre, and then it fell to the original level. Perfusion was not continued beyond one and a half hours, owing to the fact that any delayed increase in output might be due to the use of a lung from a monkey already dead.

A live monkey (*Macacus arus*) weighing 2·8 kilograms was obtained, and the lungs were perfused after preliminary injections of morphine and chloralose. No histamine appeared in the sample obtained prior to exposure to phosgene. During the first ten minutes after ventilation with phosgene (*c.t.* 4,500), the histamine content of the perfusate was 1:5,700,000, and for succeeding samples the histamine contents were as follows: 1:3,000,000 (0·33γ per millilitre), 1:1,850,000 (0·54γ per millilitre), 1:2,500,000 (0·4γ per millilitre), 1:3,000,000 (0·33γ per millilitre), 1:1,500,000

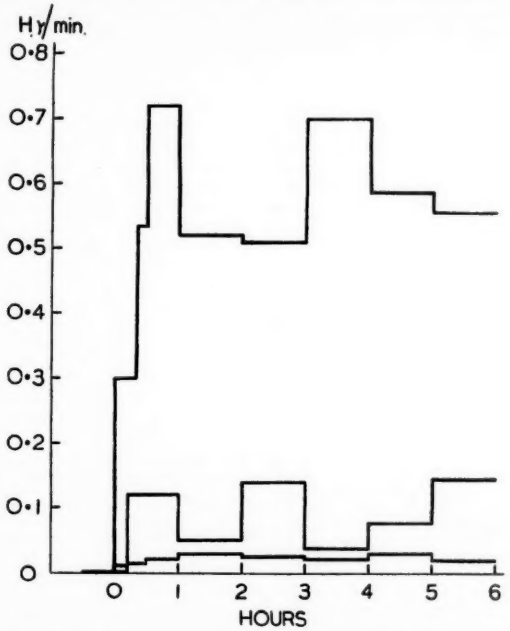

FIGURE I.

Output of histamine from the perfused lung following exposure to phosgene. Upper line, monkey; middle line, dog; lower line, guinea-pig. At O, lung ventilated with phosgene. Ordinate: output of histamine in γ per minute; abscissa: hours.

(0·66γ per millilitre), 1:1,700,000 (0·58γ per millilitre), 1:1,800,000 (0·55γ per millilitre). This is shown graphically in Figure I (top line). There was a high output during the second half hour (0·7γ of histamine per minute), followed by a fall and later a rise during the fourth hour. The output then declined slightly, possibly because little histamine was left in the lung, the content after perfusion being only 16γ per gramme.

The Liberation of a Capillary-Damaging Substance other than Histamine.

Trypan blue was injected into the ear vein of a rabbit, and samples of perfusion fluid from guinea-pig lung which had been exposed to phosgene were injected into the epilated skin of the rabbit. Provided that the perfusion fluid is free from blood, dye does not pass out of the vessels into the skin with samples obtained prior to exposure to phosgene. This is the technique used by Valy Menkin[6] in estimating the presence of leucotaxine. Ten experiments were performed. The findings are recorded in Table I. In Experiment I, Table I, no evidence of this substance was found in any of the samples taken during the six hours of perfusion when the lung was not ventilated with phosgene. In Experiment II the sample obtained prior to exposure to phosgene was without effect on the skin, that obtained for the first ten minutes after exposure had slight activity, and the sample obtained ten to thirty minutes after exposure had moderate activity in releasing dye. Thereafter the samples were inactive. The samples were neutral to litmus, and the effect is not due directly to phosgene for the reasons shown in an earlier paper (Trethewie[8]).

The active samples contained histamine in the ratios of 1:2,600,000 and 1:2,200,000 respectively; but this concentration of histamine was inactive in the skin. The effect is not due to adenosine (another tissue hormone), because when samples were tested on the guinea-pig heart preparation (Drury, Lutwak-Mann and Solandt[1]) the limit of sensitivity was 3·0γ of adenosine per millilitre, and samples of lung perfusate had no effect on the heart. However, such samples were active on the skin of the rabbit, while adenosine in a concentration of 3·0γ per millilitre had no activity on the skin. In four experiments similar results to those mentioned above were obtained. In two, no activity was observed in any sample of perfusion fluid. In the remaining two there was activity in all the samples obtained, probably owing to contained blood, because in these instances the lung did not perfuse well and the samples contained blood. Valy Menkin[6] has shown that blood is active in this regard.

It is apparent that the output of capillary-damaging substance other than histamine is evanescent.

Treatment of Phosgene Poisoning by Manganese.

Guinea-Pigs.

It has been shown that manganese will afford some protection for guinea-pigs if it is given prior to the induction of anaphylactic shock (Klopstock[3]). It has also been shown that ascorbic acid acts similarly (Hochwald[2]). Since symptoms in anaphylaxis are largely due to histamine (Rosenthal and Brown[7]), and since histamine is liberated in phosgene poisoning (Trethewie[9]), it was thought advisable to treat animals with manganese and ascorbic acid after exposure to phosgene.

Thirty-two guinea-pigs were exposed to phosgene (*c.t.* 1,854 to 2,724) in groups of eight, and sixteen were injected with Tyrode subcutaneously. The other sixteen were treated with five milligrammes of manganese (as sulphate) per kilogram of body weight and with 200 milligrammes of vitamin *C* per kilogram of body weight given eight to twenty-one minutes after exposure. Six hours later a further injection of manganese of 2·5 milligrammes per kilogram of body weight was given, and in the case of eight of the animals this dose was repeated the following day. The mortality rate amongst the treated guinea-pigs was 31% and amongst the untreated guinea-pigs 18%. It was noted that the untreated animals were more lively.

Mice.

Thirty-two mice were exposed to phosgene in two groups (*c.t.* 2,832 and 2,860). Eight of the mice in each group were injected with 0·5 milligramme of manganese and 20 milligrammes of vitamin *C*, eight to twenty minutes after exposure. To half of these mice an injection of 0·25 milligramme of manganese was given on the following day also. The paired untreated mice were injected with Tyrode. The mortality rate among the untreated mice was 44% and among the treated mice 50%. Thus the survival rate was not improved by manganese.

There is evidence that manganese acts intracellularly; thus it is not surprising that it should not be of value after exposure to phosgene, for it would have no effect upon the histamine liberated from the cells.

Treatment of Phosgene Poisoning with Iron.

Treatment after Exposure.

Iron (the ferrous salts) and ascorbic acid break down histamine (Edlbacher and Segesser[2]). For this reason mice were treated by injections of ferrous sulphate and ascorbic acid after exposure to phosgene.

Thirty-two mice were exposed to phosgene (*c.t.* 4,620 and 4,644), sixteen being exposed to each concentration. One mouse of each pair was injected with 0·5 milligramme

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TABLE I.

The Liberation of Capillary-Damaging Substance from the Perfused Lung of the Guinea-Pig.

Exposure Number.	c.t.	Control.	Time after Exposure.							
			Minutes.			Hours.				
			0 to 10	10 to 30	30 to 60	1 to 2	2 to 3	3 to 4	4 to 5	5 to 6
I.. ..	—	−[1]	−	−	−	−	−	−	−	−
II.. ..	8,600	−	±[1]	+[1]	−	−	−	−	−	−
III.. ..	6,000	+	+	+	+	+	+	+	+	+
IV.. ..	8,400	−	−	+	−	−	−	±	−	−
V.. ..	7,000	−	±	+	−	±	−	−	−	−
VI.. ..	6,500	−	±	+	+	−	−			
VII.. ..	15,000	−	−	−	−	−	−			
VIII.. ..	9,700	+	+	+	+	+	+			
IX.. ..	8,800	−	−	−	−	−	−			
X.. ..	14,000	+	+	+	+	+	+			

[1] "−", no coloration; "±", slight coloration; "+", moderate coloration.

of iron subcutaneously and with 10 milligrammes of ascorbic acid three to fourteen minutes after exposure. Iron was added to the drinking water (0·32 milligramme per millilitre). The treated mice picked up one and a half hours later, while the untreated mice still looked ill. Five hours later the treated mice looked much better. For a few hours the treated mice were very active and the untreated mice were quiet. The improvement of the treated mice was not maintained, and all 32 mice were dead within one day of exposure.

Treatment Prior to Exposure.

Sixteen mice were injected with 0·1 milligramme of iron twice a day for two days. With the initial dose 20 milligrammes of ascorbic acid were also injected. Sixteen control mice were injected with Tyrode on an equal number of occasions. Sixteen mice, eight from each group, were exposed to phosgene (*c.t.* 3,800); two to ten minutes after exposure 0·1 milligramme of iron was injected into the treated mice, and in one mouse the injection penetrated deeply. The control mice were injected with Tyrode. Two hours after exposure the untreated mice did not look so well as the treated mice. Four mice died in each group; no pleural fluid was found in any of the treated mice that died, while in all the untreated mice that died pleural fluid was present. One of the treated mice that died, the mouse which was injected deeply, had peritonitis with distension, and the needle track leading into the peritoneum could be easily seen. The lungs were fairly normal. This mouse was found dead twenty-two hours after exposure. It died of peritonitis, not of phosgene poisoning. It can neither be regarded as having died from the effects of phosgene death nor as a survivor.

The other sixteen mice were exposed to phosgene (nominal *c.t.* 4,704). Injections were made eight to eighteen and a half minutes after exposure, as in the other group. The treated animals were much better than the untreated immediately after exposure, and this condition was maintained for most of that day. All the untreated mice died, while five of the treated died. More fluid exuded from the lungs of the dead untreated mice than from the dead treated mice.

Combining these two groups, we have eight deaths out of fifteen mice in the treated group and twelve deaths out of sixteen mice in the untreated group, the percentage mortality being 53 for the treated group and 75 for the untreated group. This difference is not significant, but taken in conjunction with the other findings is suggestive. If the death from peritonitis was not excluded and was regarded as a death from phosgene, the mortality rate among the treated animals would be 56% and that among the untreated animals 75%. Since treatment was given before exposure to phosgene, and since the difference in mortality rates is so small, it was not considered advisable to continue this treatment. Further, iron in the ferrous form can act upon the histamine only after its liberation by diffusion outside the vessels. It does not appear to be a profitable line of investigation.

DISCUSSION.

It has been shown that from the guinea-pig lung a capillary damaging substance in addition to histamine is liberated into the perfusate after ventilation with phosgene. This substance causes trypan blue to pass out of cutaneous capillaries. It is not histamine, since injections of histamine in the concentration found in such a sample are without effect, or on the other hand, if the amount of histamine in the sample was sufficient to damage the capillaries, another sample from the same lung was also effective, and the amount of histamine in it was inactive. This substance is also not adenosine for the same reason. Since impure samples only of slow-reacting substance (Kellaway and Trethewie[4]) were available, it was not possible to determine whether this new substance was slow-reacting substance. It is possible that it is the substance described as leucotaxine by Valy Menkin in 1937.[5] However, the output of the substance is of short duration, and it was not detected after the fourth hour and usually not after the first. The maximum output was ten to thirty minutes after exposure. In view of this it seems unlikely that this substance can play a prominent part in phosgene poisoning. Further work will be necessary to prove this point completely.

It has also been shown that histamine is liberated from the isolated perfused lung of the dog and the monkey after ventilation with phosgene. The output of histamine from the right lung of the guinea-pig for six hours after exposure has not exceeded 8·0γ. In the case of the dogs the output from less than half of one lung averaged 63γ in this time including twice the output obtained with the three-hour perfusion. In the case of the monkey 211γ of histamine were liberated from the right lung during the same time. The dogs weighed 10·0 and 7·7 kilograms respectively, the guinea-pig 485 grammes and the monkey 2·8 kilograms. When the sensitivity of the guinea-pig to histamine is remembered, it is not surprising that the guinea-pig is killed by a much lower concentration of phosgene than is the dog. However, any close comparison of this type relating to the output of histamine cannot be taken mathematically, since all lungs were ventilated at the same rate (11 per minute) while the breathing rate of these dogs was 18 to 25 and that of the guinea-pig over 90 per minute; further, during exposure the isolated lung was ventilated at only approximately the normal volume ventilation. The *c.t.* used for the guinea-pig above was 7,000; for the dogs the average *c.t.* was 9,000; and for the monkey the *c.t.* was 4,500.

One can compare the total dose of histamine required per animal (injected into the vein) to kill 50% of test animals with the similar dose of phosgene expressed as *c.t.* When guinea-pigs (I), mice (II) and dogs (III) are so compared, they are found to lie in ascending sequence (Figure II), in spite of the fact that guinea-pigs are 800 times as sensitive to histamine as mice. The LD_{50} was determined in each case by the method of Probits, and the figures are as follows: guinea-pig, 1,622 (16 animals); mouse, 2,630 (40 animals); dog, 7,244 (80 animals). The

weights of all these animals were known, except one group in the dog section which was taken from American work, and this point lay in the same line as that given by our dogs. The dog figure agrees with American and English figures, the mouse figure is intermediate between American and English figures, and the guinea-pig figure agrees with the English figure, although in the last group it was difficult to get a line to fit the estimations. The LD_{50} histamine figures are those generally accepted, and they have been multiplied by the weight of the animals used in this work, so that the total dose required is given. One could expect agreement only if the same amount of phosgene liberated the same amount of histamine in each animal. This is by no means necessarily the case; but from the above figures the amount appears to be the same in the dog and in the guinea-pig.

It has been pointed out (Newton[9]) that the infusion of histamine into the pulmonary artery does not produce the same effect on the two venous and the two arterial pressures in the intact cat as does phosgene, though

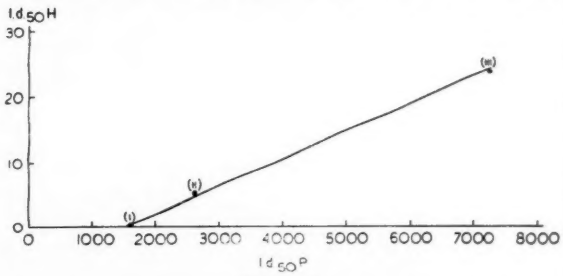

FIGURE II.

LD_{50}. Figures for guinea-pig, mouse, dog, expressed as dose for whole animal. Ordinate: milligramme LD_{50} histamine; abscissa: *c.t.* LD_{50} phosgene.

Newton also points out that histamine had not been administered by a fine spray into the alveoli. However, neither procedure strictly reproduces the condition. It has been shown (Trethewie[6]) that the histamine is liberated into the tissue spaces and not into the blood vessels. It is there that it is believed to cause damage. For this reason the lung was hyperventilated to obtain perfusate. Therefore the infusion of histamine into the blood vessels and the spraying of histamine into the alveoli are not strictly comparable. In addition, almost certainly, other toxic substances are liberated.

Histaminase is unlikely to decrease the mortality rate of guinea-pigs poisoned by phosgene even if histamine is of importance, because histaminase is slowly acting and would only slowly produce effects close to the vessel wall, leaving much histamine to be acted on only after diffusion. Thymoxyethyldiethylamine acts to its maximum soon after absorption, inhibiting the action of histamine so that the damaged vessel may readily return from its dilated state and the permeability of the wall fall to allow reduction in outward diffusion of fluid. When the *c.t.* is low (2,100) in tests on the guinea-pig, histamine does not appear for four to five hours. It is this delayed rise which is important.

Treatment with manganese following exposure to phosgene did not lower the mortality rate. Now, while manganese given before anaphylaxis enables guinea-pigs to survive the anaphylactic reaction, this may be an effect due to a depression of the anaphylactic reaction rather than an effect on histamine itself. Thus it is not surprising that manganese may not be of value in phosgene poisoning even though histamine is involved.

The effect of treatment with iron and ascorbic acid was slight, but there was a notable difference in the liveliness of the animals after injection. These substances break down histamine; but the reaction would need to be rapid and the diffusion complete if it was to eliminate the effect of liberated histamine on the blood vessels of the lung.

It would appear that a drug of the type of thymoxyethyldiethylamine is what is required in the treatment of phosgene poisoning.

SUMMARY.

Histamine is liberated by phosgene from the isolated perfused lung of the dog, guinea-pig and monkey.

A capillary-damaging substance other than histamine is also liberated by phosgene from the isolated lung of the guinea-pig.

Manganese and ascorbic acid do not lower the mortality rate of guinea-pigs or mice when given after their exposure to phosgene.

Treatment with iron and ascorbic acid tested in a group of 31 mice gave a mortality rate of 53% as compared with 75% for the untreated mice.

The significance of these findings is discussed.

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THE INCIDENCE OF TUBERCULOUS INFECTION IN MALE MEDICAL STUDENTS IN MELBOURNE

(A PRELIMINARY REPORT).[1]

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MANY investigations in different countries have shown that the incidence of pulmonary tuberculosis is much higher amongst doctors, medical students and nurses than it is in the same age groups in the general community. The results obtained by various investigators show that the situation varies between different communities, and consequently the information obtained at one place is not directly applicable in another.

To determine the incidence of tuberculous infection among medical students in Melbourne, a survey was begun by the late Eric L. Cooper, M.D., in 1936. This survey has two bases. First, the presence of skin sensitivity to old tuberculin is taken to indicate that the patient has had, or is still having, an encounter with tubercle bacilli, and second, in this community at least, pulmonary

[1] This investigation was commenced with a grant from the National Health and Medical Research Council and is being continued under a grant from the Pearson Research Fund of the University of Melbourne.

tuberculosis is by far the most common tuberculous lesion to be detected, and routine X-ray examination of the lungs should detect the lesion at the earliest possible time.

Although the survey was to be primarily fact-finding, it was realized that it would be of value as one method of supervising the health of medical students, and it was hoped that some permanent organization for the detection of tuberculosis among medical students would grow from the survey. This hope has been justified, in that each of the three clinical schools in the University of Melbourne now undertakes routine Mantoux tests and lung radiography several times during the medical student's career.

It has been decided therefore to conclude this survey when the groups at present being observed have completed their courses. Only the results for male students who have spent their childhood in Australia are presented, as the numbers of female students are too small to be of significance. This report is an interim statement which indicates the general nature of the results obtained to the end of 1946.

Plan of Survey.

For the purpose of the survey the medical course is divided into two portions, the preclinical and the clinical. In the preclinical years (first, second and third years) the student has the normal contacts with tuberculosis of any university student of the same age group. During the clinical years (fourth, fifth and sixth years) the student has an increased contact with tuberculosis in hospitals, both general and those set aside for tuberculosis. Examinations have been planned therefore for the early part of the first year, the end of the third year and shortly before the qualifying examinations in the sixth year. However, during the war years, reduction of the length of the course to five years necessitated variation of these times to meet the changes in duration of the two periods. In all cases examinations were conducted on entrance to the course, at the end of the preclinical years and at the end of the clinical course. The duration of the two periods varied from two and a half to three years each during the war years.

To provide control observations, similar examinations were planned for a group of non-medical students of the same age group in their first and third years.

Technique.

As there are several methods of testing skin sensitivity to old tuberculin, it was planned to use, on the flexor aspect of the forearm, an intradermal injection of 0·1 millilitre of a 1 in 1,000 strength of old tuberculin (Commonwealth Serum Laboratories preparation), controlled with an intradermal injection of 0·1 millilitre of a 1 in 1,000 strength of sterile broth into the opposite forearm. The reactions were read forty-eight hours after injection.

During four years (1942 to 1945) "tuberculin patches" were applied to the skin instead of the intradermal test, to compare their efficacy with that of the intradermal test. These patches were applied after the skin had been cleaned with ether and methylated spirit and allowed to dry.

In the period from 1936 to 1939 the lung radiographs[1] were taken on 17 inch by 14 inch films with a standard six-foot non-Bucky technique. The results were interpreted by one of us (K.H.H.) and the late Dr. E. L. Cooper in consultation.

Especial care was taken to report as areas of calcification only those areas about which no doubt existed.

Since the beginning of 1940 all students have been examined with a miniature radiographic plant on 35 millimetre film. These films were viewed by a radiologist (K.H.H.) and a clinician in consultation. Whenever any doubt existed as to the normality of the chest, a direct radiograph on standard 17 inch by 14 inch film was taken, and the decision of normality or otherwise was made on the film appearances.

[1] All 17 inch by 14 inch chest films were taken at the Bethesda X-Ray Laboratory and all 35 millimetre films at the Commonwealth X-Ray and Radium Laboratory at the University of Melbourne.

Results.

The results of the survey are considered under the following headings: (i) comparison of the incidence of skin reactors in preclinical medical students and non-medical students; (ii) comparison of Mantoux and skin patch tests; (iii) comparison of the incidence of skin reactors in preclinical and clinical medical students; (iv) the incidence of calcification in lung fields or lung hila in first-year students; (v) the incidence of active pulmonary tuberculosis in medical students.

Skin Reactors (Preclinical Medical and Non-Medical Students).

Mantoux tests have been performed on 418 first-year medical students and 142 first-year non-medical students, and on 428 medical students at the end of their third year. The results, grouped according to ages, are set out in Table I.

TABLE I.

Reactors to the Mantoux Test (Preclinical Medical Students and Non-Medical Students).[1]

Age. (Years.)	First Year Medical Students.	First Year Non-Medical Students.	Medical Students. End of Preclinical Years.	Third Year Non-Medical Students.
16 to 17	30 (113) 26%	10 (33)	—	—
18 to 19	87 (257) 33%	32 (86) 38%	40 (140) 29%	3 (7)
20 to 21	19 (38)	2 (14)	65 (217) 30%	10 (21)
22 to 23	4 (10)	3 (9)	30 (55)	1 (2)
24 to 25	—	—	6 (16)	—
Totals ..	140 (418) 33·5%	47 (142) 33%	141 (428) 33%	14 (30)

[1] In all tables figures in parentheses indicate the total number tested.

It is apparent from these figures that for the first-year students over the age group sixteen to twenty-three years there is no significant difference between the results in the two series. Although the figures for third-year non-medical students are small, they do not indicate any significant difference between these students and the medical group at the end of the preclinical years. These two groups therefore may be taken as a sample of the university population. They show an overall incidence of positive reactors of 187 in 560 (33%) for first-year students and of 155 in 458 (33%) for third-year students. If these figures are combined and grouped according to age groups, the percentage of positive reactors rises with age (Table II).

TABLE II.

Mantoux Reactors (General University Population).

Age. (Years.)	Positive Reactors.
16 to 17	40 (146) 28%
18 to 19	162 (490) 33%
20 to 21	96 (290) 33%
22 to 23	38 (76) 50%
24 to 25	6 (16)

Comparison of Mantoux Test and Skin Patch Tests.

Skin patch tests were applied to 364 first-year medical students aged from sixteen to nineteen years. The results are shown in Table III, divided into two two-year groups. In 1942 and 1943 the results were consistent, as were those of the years 1944 and 1945; but the reactors in the 1944 to 1945 group are remarkably less than previously.

It would appear that there was some important difference between the tests as applied to the two groups; but the exact nature of the difference is unknown.

Comparison of Preclinical and Clinical Groups of Medical Students.

Mantoux tests have been carried out on 230 medical students at the end of their clinical period, and the results are shown in Table IV, in which students in the

various age groups are followed through their medical course.

These figures show a sharp rise in the incidence of positive reactors during the clinical period of the course to a figure which is considerably in excess of that for the corresponding age in the general university population (Table II).

Incidence of Calcification in Lung Fields.

Lung radiographs were taken on 17 inch by 14 inch films of 230 students (medical and non-medical) in their first year at the university, in the years from 1936 to 1939 inclusive. In these films areas of calcification in the lung fields or lung hila were common, and the incidence is shown in Table V.

TABLE III.
Results of Skin Patch Tests (First Year Medical Students).

Age. (Years.)	Positive Reactors, 1942 to 1943 Group.	Positive Reactors, 1944 to 1945 Group.
16 to 17 ..	18 (88) 20%	9 (87) 10%
18 to 19 ..	24 (95) 25%	10 (94) 10%

These figures are confined to the findings on 17 inch by 14 inch film, as it is thought that small amounts of calcification on 35 millimetre film are difficult to assess.

Calcification is present in a high proportion of students in each age group examined, and comparison with the incidence of Mantoux reactors (Table II) shows no correlation between the results. This is strongly suggestive that the areas of calcification noted are not of tuberculous origin.

Incidence of Active Pulmonary Tuberculosis.

No case of active pulmonary tuberculosis has been diagnosed among the preclinical medical and the non-medical students. In all 941 individual students were examined at least once in the period of observation.

Eight cases of active pulmonary tuberculosis have been discovered among medical students during their clinical period. In all 378 students were being observed during this period of their course. This incidence (approximately 2%) amongst medical students in their clinical years is in pronounced contrast to that found in the general population (0·56%).

TABLE IV.
Mantoux Test Reactors (Medical Students).

Age in Years at Commencement of Course.	Preclinical Period.		Clinical Period.
	Beginning.	End.	End.
16 to 17	30 (113) 26%	40 (140) 29%	10 (15)
18 to 19	87 (257) 33%	65 (217) 30%	68 (131) 52%
20 to 21	19 (38)	30 (55)	45 (63)
22 to 23	—	6 (16)	15 (21)
Total	140 (418) 33·5%	141 (428) 33%	138 (230) 60%

Commentary.

The results obtained in this survey indicate that there is no difference in the incidence of tuberculin sensitivity between medical students in their preclinical period and the general university population of the same age. However, there is a considerable increase in the proportion of tuberculin-sensitive students during the clinical period of the medical student's course.

These findings indicate that the medical student during his hospital years is exposed to the risk of tuberculous infection to a much greater degree than the general population. The exposure presumably comes from contact with patients suffering from pulmonary tuberculosis. As most of the known cases of pulmonary tuberculosis are transferred from the general hospitals to special tuberculosis institutions, it would seem likely that much of the students' exposure comes from unrecognized cases. That there are many unrecognized cases of pulmonary tuberculosis in the community, and therefore amongst hospital patients, is clearly shown by the results of routine chest radiography of apparently healthy recruits to the armed services, by which an incidence of 0·56% was discovered.[3]

It is well recognized that the risk of developing pulmonary tuberculosis (active disease in contrast to tuberculous infection as shown by skin sensitivity tests) is greatest in individuals who are not tuberculin-sensitive. In some instances institutions have excluded from duties in contact with known sufferers from tuberculosis, members of the staff who are not sensitive to skin tests with tuberculin. As it is manifestly impracticable to require a medical student to give a positive response to the Mantoux test before starting his clinical work, every effort must be made to reduce his exposure to a level similar to that experienced by the general population. This in reality implies discovery of the unsuspected cases, and hence it requires that a radiograph should be taken of the lungs of all patients (in-patient or out-patient) attending the hospital.

TABLE V.
Incidence of Calcification in Lung Fields in First Year Students.

Age. (Years.)	Medical Students.	Non-Medical Students.
16 to 17 ..	29 (38)	8 (10)
18 to 19 ..	73 (84)	39 (41)
20 to 21 ..	12 (15)	10 (11)
22 to 23 ..	5 (5)	9 (9)
24 to 25 ..	5 (5)	4 (5)
26 to 27 ..	2 (2)	2 (3)
28 to 29 ..	2 (2)	—
Total	128 (151) 80%	72 (79) 90%

It is felt that no useful purpose would be served by speculating on the cause of the areas of calcification seen in the lung films in this series. They are apparently unrelated to tuberculous infection; but we have no data from the survey to give any clue to their origin.

Summary.

A survey to determine the incidence of skin sensitivity to tuberculin and the incidence of active pulmonary tuberculosis in medical students has been in progress for ten years, and a preliminary report is recorded.

No difference in the proportion of positive skin reactors is found between medical students in preclinical years and the general university population of the same age.

A significant increase in the proportion of positive reactors is seen in medical students at the end of their clinical years.

No case of active pulmonary tuberculosis was found among medical students in their preclinical years; but an incidence at least four times as high as that in the general population occurred among these students during their clinical years.

Areas of calcification in the lung fields or hilar glands were commonly found in the lung radiographs, but comparison with the Mantoux test results suggests that these areas are of non-tuberculous origin.

Acknowledgements.

A survey of this size would obviously be impossible without the cooperation of many people, and we wish to acknowledge our indebtedness to the following: the late Dr. E. L. Cooper, whose unbounded energy made possible the organization and commencement of the survey; Professor P. MacCallum for his assistance and encouragement at all times; Dr. Cecil Eddy, of the Commonwealth X-Ray and Radium Laboratory at the University of Melbourne, and his staff, who have been responsible for

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developing the miniature radiographic plant from an experimental stage, and for obtaining an unusually high degree of excellence in the miniature X-ray photographs; the various medical officers who have assisted in performing and reading skin tests, and particularly Dr. A. R. Kelly, who carried the burden of organization of the research work during the years 1943, 1944 and 1945; the staff of the pathology department of the University of Melbourne for their technical and other assistance at all times.

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TUBERCULOSIS INFECTION IN NURSES.

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IN 1938, in order to discover what proportion of nurses in general hospitals in New South Wales become infected (as distinct from invalided) with tuberculosis, I commenced a survey in which I applied the intracutaneous tuberculin test to nurses at eleven general hospitals who volunteered for the purpose. The reactions to the test of 1,025 of these nurses were published in 1940.(1) At two of the hospitals I have been permitted to continue making tuberculin tests of the nurses ever since, and at a third hospital I have made several hundred tests. As a result I am now able to report the reactions to tuberculin of 2,705 nurses. Of these I have been able to test 948, who did not at first react, at intervals during their professional training, and so to observe directly the frequency and incidence of tuberculosis infection amongst them. The sum of the periods of observation of those tested more than once was 1,806 years. The total number of tests made was 4,534.

TABLE I.

Reactions to the First Intracutaneous Tuberculin Test of 2,705 Nurses in General Hospitals Grouped According to Age.

Age. (Years.)	Number Tested.	Number of Reactors.	Reactors *per Centum.*
15 to 19	1,327	307	23·1
20 to 24	1,043	415	39·8
25 to 29	268	163	60·8
30 and over ..	67	51	77·3

TABLE II.

Reactions to the First Intracutaneous Tuberculin Test of 1,327 Nurses, Aged Less than 20 Years, Grouped According to the Duration of their Residence in Cities and Large Towns.

Duration of Residence in Cities and Large Towns.	Number Tested.	Number of Reactors.	Reactors *per Centum.*
Less than 10 years	551	99	17·9
Over 10 years ..	776	208	26·8

The tests were made with a single injection of the purified protein derivative of tuberculin ("tuberculin P.P.D.") by the method of Anderson and Harvey.(2) Briefly this method is to inject a strong solution containing enough tuberculin P.P.D. to produce a reaction in all or nearly all potential reactors, but in such small bulk as not to cause a sore arm in the very sensitive. All the injections were made by myself, and all the reactions except a few dozen were measured by myself.

The reactions to the test of the whole of the nurses tested for the first time are set out in Table I. In Table I the proportions of nurses infected in each quinquennial age group are shown, and in Figure I these proportions are compared with the proportions infected in corresponding age groups of young women following occupations other than nursing. It is shown that of those aged fifteen to nineteen years some 23% of the nurses are infected, whereas 29% of the young women in the general population of New South Wales are infected. The reason for the difference is that a large proportion of the younger nurses were girls fresh from the country, where they had always lived prior to entering their profession. It has already been shown(3) that the incidence of tuberculosis infection is much less in country districts of New South Wales than in Sydney, and this is further demonstrated in a striking manner by Table II.

The rate of infection is greater in the nurses than in the other young women. In fact, it is rather greater than the tables set out in quinquennial age groups would imply, because the average age of the nurses in the fifteen to nineteen years age group is 18·7 years, while that of the nurses in the twenty-five to twenty-nine years age group is 26·9 years, a difference of only 8·2 years; moreover, the period during which the nurses are exposed to special risk is only four years. In Table III the nurses are grouped according to the duration of their professional studies, and from the percentage of reactors in each group it may be calculated that the rate of infection is about 13% *per annum*—about four times the rate for young women in the general population, which may be calculated (from material published previously(4)) to be 3·6 *per annum*.

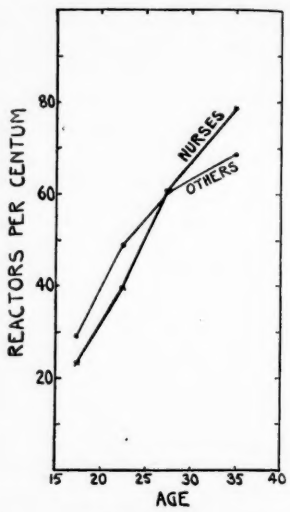

FIGURE I.

Reactions to the intracutaneous tuberculin test of nurses undergoing their professional training in general hospitals in New South Wales (from Table I) and of young women following occupations other than nursing (from a previous survey(4)) grouped according to age.

When Table III is dissected, as it is in Table IV, so that each annual group of nurses is divided into quinquennial age groups, it is seen that the senior nurses are much more heavily infected than the junior nurses, not only because their average age is greater, but age for age. Table IV is illustrated in Figure II.

TABLE III.

Reactions to the First Intracutaneous Tuberculin Test of 2,705 Nurses in General Hospitals Grouped According to the Duration of their Professional Studies.

Duration of Studies.	Number Tested.	Number of Reactors.	Reactors *per Centum.*
0 to 1 year ..	1,969	516	26·2
1 to 2 years ..	248	107	43·1
2 to 3 years ..	187	105	56·2
3 to 4 years ..	143	93	65·0
Over 4 years ..	158	115	72·8

When Table III is dissected as in Table V, so that each annual group of nurses is divided into groups according to their hospitals, it seems that the incidence of infection is higher at one hospital than at the others; but the numbers tested are rather too small for conclusions to be drawn.

That the incidence of infection differs materially at the different hospitals was shown much more clearly and certainly by the testing of 948 nurses at intervals during their professional training. The sum of the periods of

TABLE IV.

Reactions to the First Intracutaneous Tuberculin Test of 2,705 Nurses in General Hospitals Grouped According to the Duration of their Professional Studies and also According to Age.

Duration of Studies. (Years.)	Age. (Years.)														
	17 to 19.			20 to 24.			25 to 29.			30 and Over.			Total.		
	Number Tested.	Number of Reactors.	Reactors *per Centum.*	Number Tested.	Number of Reactors.	Reactors *per Centum.*	Number Tested.	Number of Reactors.	Reactors *per Centum.*	Number Tested.	Number of Reactors.	Reactors *per Centum.*	Number Tested.	Number of Reactors.	Reactors *per Centum.*
0 to 1 ..	1,268	285	22·5	573	172	30·0	116	53	45·7	12	6	50·0	1,969	516	26·2
1 to 2 ..	47	17	36·6	172	71	41·3	27	17	62·9	2	2		248	107	43·1
2 to 3 ..	9	3		144	81	56·3	29	20	68·9	5	1		187	105	56·2
3 to 4 ..	2	1		100	60	60·0	34	27	79·4	7	5		143	93	65·0
Over 4 ..	1	1		54	31	57·4	62	46	74·2	41	37	90·2	158	115	72·8

TABLE V.

Reactions to the First Intracutaneous Tuberculin Test of 2,705 Nurses in General Hospitals Grouped According to the Duration of their Professional Studies and also According to Hospital.

Duration of Studies. (Years.)	First Hospital.			Second Hospital.			Other Hospitals.			Total.		
	Number Tested.	Number of Reactors.	Reactors *per Centum.*	Number Tested.	Number of Reactors.	Reactors *per Centum.*	Number Tested.	Number of Reactors.	Reactors *per Centum.*	Number Tested.	Number of Reactors.	Reactors *per Centum.*
0 to 1 ..	364	93	25·6	1,405	374	26·6	200	49	24·5	1,969	516	26·2
1 to 2 ..	37	24	64·8	129	51	39·5	82	32	39·0	248	107	43·1
2 to 3 ..	45	27	60·0	83	47	56·6	59	31	52·6	187	105	56·2
3 to 4 ..	21	16	76·2	56	37	66·1	66	40	60·6	143	93	65·0
Over 4 ..	17	15	88·2	69	52	75·4	72	48	66·7	158	115	72·8

observation of those tested was 1,806 years and infection with tuberculosis was shown to have taken place in 270, an average of 15 infections per hundred nurses per year of observation. However, when these results are dissected, as in Table VI, and the frequency of infection at the three different hospitals where the tests were made is compared, it is found that at the first and third hospitals there were 27 infections and 26 infections respectively per hundred nurses per year of observation, while at the second hospital there were only 11 infections per hundred nurses per year of observation. At the first and third hospitals patients with pulmonary tuberculosis were nursed in the general medical wards, while at the second hospital patients known or found to have tuberculosis were placed in special wards and cared for by a special staff. It may be inferred that the nursing of tuberculous patients in the general hospitals in special wards pays a handsome dividend in the protection of nurses from infection. At the first hospital a special ward was opened a few years ago for women patients suffering from tuberculosis; but owing to the war a plan to open another special ward for men patients suffering from tuberculosis was not put into operation. It is interesting to find that the removal of the tuberculous female patients from the general wards was followed by a lessening of the frequency with which nurses became infected during their training. This is shown in Table VII. But the frequency with which nurses become infected is still more than twice the frequency amongst the nurses at the hospital where all patients with tuberculosis are nursed in special wards.

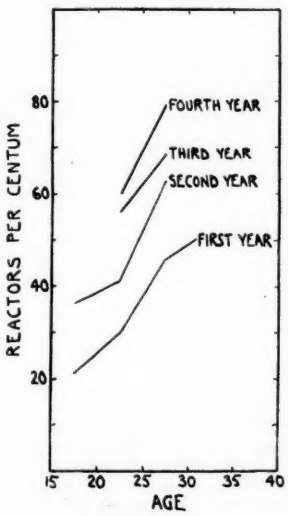

FIGURE II.

Reactions to the intracutaneous tuberculin test of nurses in training at general hospitals in New South Wales, grouped according to age and the duration of their professional studies (from Table IV).

Acknowledgements.

It is a pleasure to acknowledge my indebtedness to Miss M. Alt and to Miss M. B. Sirl, who willingly gave me indispensable help in the organization of the tests from the beginning to the end of the work. I feel much indebted also to the following ladies and gentlemen, who helped me in various ways, especially by enabling me to get in touch with the large numbers of sisters and nurses who volunteered themselves as subjects for the Mantoux test: Dr. A. B. Lilley, Miss P. M. Machin, Miss E. M. Neate, Dr. J. M. Banks, Miss A. Bridgman and Miss I. D. Burgess; also to Mr. W. H. Jones (of Kalamazoo (Australia) Limited) for mechanical help in the extraction of statistics from the protocols.

TABLE VI.

Information Derived from Applying the Intracutaneous Tuberculin Test to 948 Nurses at Three General Hospitals in or near Sydney at Intervals During their Professional Training.

Hospital.	Number of Nurses Observed.	Years of Observation.	Number Infected.	Number of Infections per Hundred Nurses per Year of Observation.
First hospital ..	241	400	109	27
Second hospital ..	666	1,371	152	11
Third hospital ..	41	35	9	26

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(1) D. Anderson: "Studies in Tuberculosis. II: Tuberculosis Infection in Nurses, with Special Reference to Incidence in New South Wales", THE MEDICAL JOURNAL OF AUSTRALIA, Volume I, 1940, page 781.

TABLE VII.

Analysis of Part of Table VI Showing the Rate of Infection Before and After the Segregation of Certain Tuberculous Patients.

Hospital.	Number of Nurses Observed.	Years of Observation.	Number Infected.	Number of Infections per Hundred Nurses per Year of Observation.
First hospital, first period	110	156	48	31
First hospital, second period ..	165	244	61	25

(3) D. Anderson and C. Harvey: "The Intracutaneous Tuberculin Test of Mantoux: A Method Employing a Single Injection", THE MEDICAL JOURNAL OF AUSTRALIA, Volume II, 1938, page 378.

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VICTORIA'S TUBERCULOSIS PROBLEM.

By H. M. JAMES,

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OFTEN in the stilly watches of the dawn, when the brain has recovered from the routine worries of the day, and some sleep has brought a little clarity to what seems at times a bemused and befuddled head, I have pondered on what might be done for tuberculosis in this State of ours. Musings such as these are inclined to be Utopian; but for what they are worth I am setting some of them down.

The Problem.

Mass X-ray surveys are now accepted as powerful weapons in any anti-tuberculosis programme. Should we survey the whole of Victoria's population of 2,000,000 in one glorious sweep tomorrow, we know from our previous experiences that we would have immediately on our hands some 20,000 to 25,000 people in whom the X-ray has shown some evidence of pathological changes in the lungs. Of these, further investigation would reveal 8,000 to 10,000 in whom there was evidence of significant tuberculosis. Many of these would be known to us from previous records. Some would have had sanatorium treatment and would be back at work with "arrested" lesions. Some would be patients prolonged observation of whom had revealed no evidence of active disease. Many, however, would either be subjects of active pulmonary tuberculosis or those in whom arrest of the disease was of such short duration as to render them liable to reactivation. A careful study of some representative groups from our own case records over the last twenty years and some simple sums in proportion[1] have indicated that of the 8,000 to 10,000 discovered sufferers from significant tuberculosis, approximately 4,000 would still need close supervision, and of these approximately 2,000 would need institutional treatment. We would appear to have answered our first problem. Victoria needs 2,000 beds for pulmonary tuberculosis.

However, it is not quite so simple as it seems. In Victoria in 1946, 104 patients died from non-respiratory tuberculosis—infections of the meninges, the genito-urinary system and so on. If we are to attempt to control tuberculosis, we must remember that it is frequently not a disease of one system only. We must not imagine that we can shut up each system in an exclusive compartment and ignore the others. All tuberculosis should be treated under the guidance of the one authority. On a bed per death ratio in accordance with the now generally accepted practice, we need another 300 beds for non-respiratory tuberculosis, so that our aim for Victoria should be 2,300 beds in all.

How are these beds to be allotted? The first consideration, of course, is the separation of the acutely ill from the mere convalescent or the subject with chronic disease. The first group need hospital-type sanatoria. The second group may be accommodated in what we regard as sanatoria proper.

Overseas the efficiency of a province or State is measured in inverse proportion to the number of patients dying from tuberculosis outside institutions. From the point of view of prevention of the spread of tuberculosis, all patients should die in institutions. Theoretically this is possible, but in practice it is hopeless. In many cases the diagnosis is not made until death. A number of patients are sufficiently wealthy to be able to provide isolation and care for themselves. There are many other factors, some not particularly creditable to ourselves as administrators. However, it may be accepted as reasonable if 75% of the total deaths from tuberculosis take place in institutions. In Victoria in 1946 750 persons died from all forms of tuberculosis. We must therefore be prepared to find 540 beds for the dying. These must not be all in the one hospital or sanatorium. Nothing can be worse than the reputation or morale of a home for the dying. Deaths must be apportioned between all institutions.

It is anticipated that 300 to 400 of our prospective 2,000 patients will need major surgery of some kind before the completion of their treatment.

Children present a special problem. It is known that there are at present in Victoria about 50 children with diagnosed primary tuberculosis. My own feeling is that with more intense concentration, particularly on contacts, two or three times that number could be discovered. One feels that in many ways the child with the primary complex is better treated in a good home; but nevertheless a number of institutional beds are needed.

Over and above these classes we meet one of our worst problems in the chronic indolently infective subject; the patient goes on for years and years, never very well, never very ill, always "sputum positive" and ever a danger to his family and contacts. Ample accommodation must be provided for these people if our public health measures are to be in any way efficacious.

Summing up, one may say that beds for tuberculosis in Victoria are required as follows.

In the hospital type of sanatorium, 400 beds are needed for patients with acute tuberculosis and those requiring major surgical treatment, 200 beds for acute non-respiratory tuberculosis, 50 for children acutely affected, and 150 for a proportion of the dying—a total of 800 beds. The suggestion is made that two hospital sanatoria of 400 beds each, one for male and one for female patients, are required.

In the sanatorium or convalescent type of institution, 760 beds are needed for convalescent and chronically ill patients and for those requiring minor surgical procedures, 100 for those with chronic non-respiratory tuberculosis and those convalescent from it, 50 for children, chronically ill and convalescent, 200 for indigent patients with indolent infections, and 390 for a proportion of the dying—a total of 1,500 beds. The suggestion is made that five sanatoria of 300 beds or four sanatoria of 400 beds be provided.

[1] A block of 1,000 known patients was taken and analysed. The period during which these patients had been under observation varied from a few months to twenty years and was strictly representative. It was necessary to examine the files of 1,085 patients, as 85 could not be traced. Of the 1,000 patients, 70% had had sanatorium treatment; 572 were well and working, and 203 had completed treatment, but were still at the resting stage. Of the remaining 225, 120 sanatorium patients had retrogressed and needed further treatment, 23 had refused sanatorium treatment but needed it, 27 were in sanatoria, and 30 were on the waiting list for admission to sanatoria. Twenty-five patients were under treatment by private medical practitioners. It is presumed that in any public scheme there would still be patients for private treatment; therefore this left 200 patients, or 20%, requiring institutional treatment. Calculation of 20% of the expected total of 10,000 cases of pulmonary tuberculosis discovered gave the figure 2,000.

These figures, then, are presented as those necessary to provide accommodation for all tuberculosis patients in Victoria. It is suggested after much consideration that the distinction between the ex-soldier and the civilian be dropped. All are individuals and entitled to the best possible treatment. Only by the combination of experience and by the pooling of all knowledge can we provide the best for everyone. There will be adjustments to make; but I am convinced that the only way in which a State-wide scheme for the eradication of tuberculosis will be successful is that it shall be unified and under the one authority.

Type of Accommodation.

When one bears in mind that it is proposed to lengthen the average stay of patients in sanatoria from six months to anything up to two years, it becomes immediately necessary to provide that the accommodation shall be pleasant and æsthetically satisfactory. Nothing could be less conducive to recovery than staring at four blank walls for twelve months. What is wrong, then, with some artistic interior decoration? Raybrook State Sanitarium in Upper New York provides a striking example of this, each floor having a different floral *motif*. Another sanatorium had wall pictures changed round from room to room once a week. Dining rooms need artistic furniture, tables need attractive covers, and even the crockery may be patterned. Bed trays should be dainty. Exterior surroundings should be as pleasant as possible. Wooded views and scenic vistas cannot but help a patient feeling rather sick of himself and his fellow men. Generally speaking the patient should feel at home. Can there be anything but benefit from bringing in a little beauty?

It is thought that from 25% to 30% of single rooms are necessary for the very ill and for "poor mixers". Others are probably better in wards containing from four to six beds. The two bed ward has the disadvantage that its inmates in time will almost invariably either feel extreme hate for each other or be so attached that the inevitable separation when it comes will be a minor tragedy. In the three bed ward usually two of the patients will "gang up" against the other. The days of the twenty to thirty bed ward seem to have gone.

In the sanatoria for convalescents provision should be made at the outset for workshops and for reading and recreation rooms. Too often these are after thoughts, and some room or other lying spare is made available. All workshops should be planned in advance to give ample room, good lighting and convenience, and should not be just accidents.

For the patients with chronic indolent infections and for indigent patients portion of the sanatorium should be set aside. These patients do not need such close medical supervision and could be allowed some relaxation from the strict discipline of the hospital or sanatorium. They should be encouraged to make this portion of the institution into a comfortable home—a home for life as it will be in many cases.

It is accepted that 25% to 30% of patients relapse after leaving the sanatorium, and provision must be made for these to return.

May I leave this suggestion—that a sanatorium should be a pleasant place and one in which patients will feel at ease? After all, it costs very little more to be slightly artistic and show some taste than it does to set up an institution of severe efficiency.

Management.

For 2,300 patients, 46 medical officers will be required. How can we persuade 46 medical men in Victoria to take up the treatment of tuberculosis as a life work? Too often it has been regarded as the refuge of the incompetent, the tired and the physically unfit. This attitude must go, and it must be taught that the study of tuberculosis is fascinating and complex. We really know little about it yet. How few of us can give an accurate prognosis after first viewing a minimal lesion? Who of us can explain why a patient with a chronic bilateral infection and extensive cavitation can and does go on working for years with little or no disability, whilst another with an initial minimal lesion slowly dies in spite of every advantage of modern medicine and surgery? Students must be taught thoroughly, even to the extent of a short residence in a sanatorium. A benevolent government might even pay them some allowance for their residentship.

Once qualified and having had his hospital training, the young medical graduate must be attracted to the treatment of tuberculosis by better conditions than now exist. He should realize that both in medicine and in surgery great steps have been made of recent years. By far the last word in chest surgery has not yet been said, and a beginning has only just been made with the antibiotics. Adequate salaries must be paid, ranging from £750 *per annum* for junior medical officers to £2,000 for full-time surgeons. There is sufficient surgery in pulmonary tuberculosis in Victoria to occupy the full time of a chest surgeon. There must be security of tenure, advancement by merit and provision for retiring allowance at a reasonably early age. Sanatoria must be supplied with modern medical libraries and pathological departments. Research should be encouraged and rewarded. Study leave should be given, and one or two medical officers should be sent abroad every year to Europe and America to absorb by direct contact the best that the rest of the world can give us.

Actual facilities in the sanatorium should be first class, and not makeshift as they so often are now. An artificial pneumothorax room should be surgically perfect and not just any old room haphazardly disguised as a surgery. The medical officer in charge of a section should have his own office, with fluoroscope, viewing boxes and even a "Dictaphone". He should feel that his is an important job and merits every convenience.

Consultations and conferences on all patients should be held once or twice a week. These conferences should be attended by all the staff—superintendents, surgeons, pathologists, radiologists and visiting consultants in special branches of medicine. Every line of treatment should be thoroughly discussed before being proceeded with. Outstanding figures in the world of tuberculosis should be invited for periodical visits, and guidance should be sought in every possible way. From America alone (three days distant by air) we could see and hear Burns Amberson or Max Pinner on clinical methods, John Alexander or Edward Overholt on surgery, Clair Brink on organization, George Ferguson on *Bacille Calmette Guérin*, Corwin Hinshaw and William Feldman on research, or Henry Sweeney on pathology. The benefits to us would be incalculable.

In all, for the medical man tuberculosis must be made a fascinating, well salaried and well furnished study. If we achieve this we shall have no lack of recruits.

Similarly for a scheme of this kind nurses will be needed, some 450 to 500 of them. They will never be recruited unless the service is a service with a future—a service affording merit promotion and security of tenure with superannuation benefits. Acceptance of tuberculosis as a compensable disease would also be advisable. The trained tuberculosis surgical nurse reaches an extremely high grade of efficiency, and every nurse should be given as her aim membership of the special surgical team for major chest surgery. Salaries a little on the extravagant side should be paid. Because most of the sanatoria will be somewhat isolated, special care must be given to the amenities and first-class recreational facilities must be provided. Over and above all, the nurses must be taught the science of tuberculosis and taught it well. Again, these nurses must be taught that theirs is a special job and that they will be treated as worthy of it. Protection with *Bacille Calmette Guérin* of those who do not react to the Mantoux test should be universal. Study and recreational leave should be generous.

Diagnostic Aspects.

It is accepted that one mass X-ray unit is needed for every 250,000 of the population, and on these figures eight units would be required for Victoria, four for the metropolitan area and four for the country. Some should be of the caravan type and some of the transportable

type. For large, well populated areas the transportable type is undoubtedly the most efficient. Its setting up in a hall, schoolroom or factory first-aid post takes a few hours, but the time spent is justified by the numbers handled. For more isolated areas where smaller numbers are found the caravan is more suitable, being already set up, as it were, and ready to be plugged in. Working at full capacity, a mass X-ray unit can handle 1,000 people daily. It would be too much to expect this to be done day in and day out throughout the year; but properly organized, one unit should be able to carry out its quota of X-ray examinations every second year.

Mass X-ray units cannot be considered as diagnostic centres, but only as feeders to the more comprehensive units or chest clinics. Melbourne proper needs three full-time chest clinics, or one to about every 300,000 of the population. It is suggested that in addition five other part-time chest clinics should be established in the more populous country centres. In these clinics all facilities for diagnosis should be present, with full pathological and bacteriological equipment including that required for cultural examinations and animal inoculation.

No out-patient clinic can be entirely satisfactory, as in many cases thorough hospital investigation is necessary. Provision for bronchograms and bronchoscopy is essential. Many other forms of investigation are at times necessary, and it is suggested that a 100 bed diagnostic chest hospital is needed. This could be set up as an annexe of one of our great public hospitals or else maintained as a separate unit.

The provision of a mass X-ray service, consulting chest clinics and a diagnostic chest hospital should not leave many gaps in the field of diagnosis.

Rehabilitation.

It will be noticed that in this scheme so far I have rather obviously ignored some 6,000 patients with tuberculosis in all stages from recent arrest to probable absolute cure (if such a thing exists). These patients are not in need of institutional treatment, but may require periods of rest and care from time to time. A rehabilitation service becomes a necessity for these people. They need close supervision by the chest clinics and direction as to their present and future activities. In England there is in existence for this type of patient the well known colony of Papworth. Victoria is hardly big enough to support another Papworth. Ideally these colonies should be self-supporting, but in practice this is rarely so. The idea is here suggested that it might be possible to establish a small housing settlement not far from one of the major sanatoria, where patients with arrested tuberculosis could be given preference of housing and where also might be established one or two sheltered workshops. The cost, of course, could only be guessed. An actual rehabilitation service need not be expensive. Two of the most successful in the United States of America and Canada are practically one-man jobs. However, good teachers are needed. Clerical, technical and even cultural subjects must be taught in the sanatoria, and it has been found in practice that approximately one teacher to each hundred patients is needed. The broad principle is that of finding in what direction the patient's capabilities lie and then of directing his steps along these lines.

The rehabilitation service takes the patient from the day of his diagnosis through his subsequent sanatorium life, and then follows him back to rejoin his fellow men in civil life. Close liaison must be established by the rehabilitation officer between the patient, the employer and the medical attendant.

For the young single person at work it would be wise to establish hostels in the cities. Staffed by a capable housekeeper, these may actually be self-supporting.

Many books have been written on rehabilitation, but the main contention for the purposes of this paper is that a rehabilitation service is essential and that it need not be expensive.

Finance.

The plight of the breadwinner stricken with tuberculosis has been so often stressed that there is no need to discuss it further here. Adequate finance is essential in order to persuade the breadwinner to take early treatment. Recently the Commonwealth Government made a grant of £59,000 to the State of Victoria to provide some sort of sustenance for the tuberculous breadwinner. We have spent many hours working on the allotment of this money. A basic wage is the minimum that should be offered. To give this to all the tuberculous patients in Victoria unable to work would use up the whole of the Commonwealth grant of £250,000 for all States, but it would be well spent. I have in this paper concentrated rather more on the patient than on his family and contacts. Supervision of these contacts is the responsibility of the chest clinics through their medical officers and visiting nurses. With adequate financial help it can be assured that the children are well housed, fed and clothed. For the under-nourished and weakly the Department of Education has established open-air schools and these are most valuable. A sufficient number of capable, well-trained and tactful visiting nurses with adequate transport is essential for home observation and control. At least 40 are needed in Melbourne alone. Even this number would give each nurse about 125 families to supervise yearly. However, all the supervision in the world is useless unless the wherewithal is there to improve conditions as found.

What Will all this Cost?

The cost would be approximately £1,000,000 *per annum*. In the United States of America where some extravagance and inflation are present, hospital sanatoria cost from £7 to £8 per week for each patient. By careful management and group-buying we should be able to manage similar institutions for £6 per patient per week. A convalescent sanatorium should run for about £3 per patient per week. We might set it out as follows:

	£
Hospital sanatorium beds, 800, at £6 each ..	250,000
Convalescent sanatorium beds, 1,500, at £3 each	230,000
Full-time chest clinics, three, at £20,000 each	60,000
Mass X-ray units, eight, at approximately £3,000 each	24,000
Part-time country chest clinics, five, at £5,000 each	25,000
One hundred bed diagnostic chest hospital at £6	31,000
Financial allowances to breadwinners	250,000
Total:	£870,000

In addition there are certain figures which must be even more roughly guessed at. I am suggesting that administrative and headquarters expenses, and subsidies to settlements, sheltered workshops and hostels and to rehabilitation generally, together with some allowances for raising this money (which I propose to discuss later) would account for another £130,000, making the total amount a round cool and comfortable £1,000,000.

How Can we Raise £1,000,000 per Annum?

The State Government of Victoria is at present spending £250,000 per year on tuberculosis and providing not an inefficient but an inadequate service. The Government should be encouraged to double its yearly contribution and spend £500,000. For the other half million I suggest that the man in the street be given the opportunity to join in the fight against tuberculosis, that he be made to feel that every penny he contributes is a nail in the coffin of this complaint, and that it is not only his privilege to do so but also his duty. After all, £500,000 *per annum* represents only about one penny per week per head of population in Victoria. And what do we propose to give for one penny per week? Free X-ray examination, free complete clinical investigation in doubtful cases, free treatment in diagnosed cases and maintenance up to the basic wage for all tuberculosis sufferers unable to work. In other words, we are offering complete insurance against tuberculosis for one penny per week.

How can we raise this money? Only by the establishment and development of a country-wide anti-tuberculosis association. The United States has its seal campaign for raising money. The seal campaign costs seventeen cents for every dollar raised. I think we can do better than that. We can build on the experience of America and perhaps invite young men of the calibre of Edward O'Brien of Toronto or Glen Armstrong of Los Angeles to teach us the rudiments of organization. From that we must build ourselves up, and sell, sell the fight against tuberculosis, and all for one penny per week.

You may ask what will happen to all our buildings in twenty years' time, when the death rate from tuberculosis is reduced to one or two per 100,000 of the population per year and our beautiful institutions lie empty. There will be other problems and other needs. Possibly the buildings will serve as homes for retired taxpayers. Heigh ho, Utopia!

Reports of Cases.

RESECTION AND RECTAL ANASTOMOSIS UNDER COVER OF SULPHASUCCIDINE WITH PRESERVATION OF SPHINCTERIC CONTROL.

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THE following case is presented and discussed because it is thought that in a number of cases of carcinoma of the upper part of the rectum and of the recto-sigmoid junction the normal function can be safely preserved as a result of a combination of (i) careful selection of cases, (ii) the use of sulphasuccidine and sulphathalidine, and (iii) careful (and in this case an "aseptic technique") anastomosis. This operation was seen in almost general use in America during a visit last year. Waugh and Clagett, at the Mayo Clinic, and Allen, of Boston, were employing it, to name but a few.

The operation of anterior resection of the rectum is pathologically sound, as spread of a carcinoma of the rectum is upwards and not downwards, and the same lymphatic area and just as much bowel can be removed above the growth. Dixon (1944) had no retrograde spread in 200 cases. Westhues (quoted by Dixon) had one case of downward spread in 74 cases. Gabriel, Dukes and Bussey in 1935 made the following statement:

> Lateral or downward lymphatic spread is only found in a late stage of the disease when the hæmorrhoidal lymphatics are blocked by metastases. By the time this downward spread has occurred, it is unlikely that the disease can be eradicated by surgical excision.

Gabriel in 1945 stated that "extension to the paracolic glands and downward extension in the peri-rectal tissues are only found in late cases in which extensive extra-rectal spread has taken place". Coller, Kay and MacIntyre (1940) reported no case of retrograde spread in 53 cases.

In many abdomino-perineal removals of tumours, normal rectum below the growth is needlessly sacrificed.

Clinical Record.

A woman, aged sixty-five years, had been constipated all her life. Three months before being examined she had become more constipated, and in the last ten days her bowels had not been opened despite many doses of cascara, many ounces of paraffin oil, and four or five enemata and bowel washouts given by a trained nurse. She had had no pain until a fortnight before being examined, when severe and colicky suprapubic pain developed. She gave a history of having had a symptomless uterine fibroid tumour diagnosed twenty years before.

On examination at this stage the patient had an enormously distended abdomen; the distension was generalized. No mass or viscus was palpable, and a rectal examination was no aid to diagnosis. A straight X-ray film of the abdomen revealed tremendous distension of the caecum and examination after a barium enema revealed a partial obstruction at the recto-sigmoid junction. Some of the barium went on and filled the lower part of the descending colon (Figures I and II).

Under spinal anæsthesia a right small paraumbilical incision was made and the large bowel was found to be distended as far down as the sigmoid colon. The liver was seen to be free of secondary deposits. A double-barrelled "defunctioning" colostomy was made in the transverse colon, after air had been aspirated through a hypodermic needle introduced into the transverse colon via one of the tæniæ. This action deflated the colon sufficiently to allow of the safe suturing of a "spur" five

FIGURE I.

Tracing from X-ray film after barium enema, showing blockage of barium at recto-sigmoid junction and distended bowel above. The long-standing uterine fibroid tumour is also shown (stippled area).

inches long. After operation the patient's general condition improved rapidly, and her colour, from being a yellowish and sickly brown, became normal.

Three weeks after this emergency operation to relieve the complete obstruction, the second operation was undertaken. The bowel had been washed out from above and below daily, and for five days before operation sulphasuccidine emulsion had been run through from above twice a day. (*Thirty ounces of a 5% emulsion in all were used.*)

Under ether anæsthesia the abdomen was opened through a left lower paramedian incision. After the patient had been put in the extreme Trendelenburg position, an enormous fibroid tumour (the patient had known of its presence for at least twenty years), which extended well down the cervix to the uterus, was displaced forward and the growth was felt at the recto-sigmoid junction. No enlarged lymph glands or liver metastases were felt. The sigmoid and superior hæmorrhoidal arteries were tied and cut, the peritoneum on each side of the rectum was opened, and the rectum was stripped down to below its middle third. This mobilization of the upper two-thirds of the rectum resulted in the growth's being brought up by about

an inch and a half and then an aseptic anastomosis with Wangensteen's clamps was made between the rectal stump and the upper part of the sigmoid colon, which had been mobilized. Continuous catgut on an atraumatic needle was used for the inner line of sutures and interrupted mattress silk sutures were used for the outer line. The mattress sutures in the bowel wall were placed transversely so as to be parallel to the blood supply. The suture line was reinforced with pads of fat. The abdomen was drained with a soft "Penrose" rubber drain and the wound was sewn up, catgut being used for the peritoneum and muscles; tension sutures of tantalum wire were employed and Michel clips were inserted in the skin. The duration of operation was an hour and three-quarters. This time is almost double the time required in the same hands for

FIGURE II.
Showing the length of bowel and mesocolon which was removed.

the combined operation for removal of the rectum, the extra time being required for care and gentleness in the procedure so as not to endanger the blood supply of the bowel.

After operation the patient's condition gave no worry and she required neither fluids intravenously nor blood transfusion. Examination of sections of the specimen removed showed that the tumour was an adenocarcinoma (Dr. Andrew Brenan).

The colostomy spur was crushed as soon after operation as possible, at the end of a week. (Early restoration of the fæcal stream prevents the development of stricture at the site of anastomosis.) One month later, after a preoperative course of sulphasuccidine (two grammes every four hours for four days), the colostomy was closed under "Pentothal" anæsthesia. Both limbs were dissected out, a double continuous layer of catgut was applied to the mucosa, and the muscles were united by catgut sutures over the extraperitoneal closure. Silkworm gut was used for the skin.

The patient is now passing normal fæces *per rectum*, with normal control, and the colostomy has remained closed and the wound has remained uninfected.

Discussion.

It has long been shown that the spread of carcinoma of the rectum is mainly upwards and not downwards. Resection of the rectum is made at least one inch below the growth, while the same lymph and vascular area above the growth as in the abdomino-perineal resection is excised, and then a meticulous and aseptic anastomosis of the upper part of the sigmoid colon or the lower part of the descending colon (if the splenic flexure is mobilized) is made to the stump of the rectum. Almost as much bowel is removed as in the abdomino-perineal resection of the rectum; but in suitable cases the patient is left with a continent and normal anus. If, after the rectum has been dissected from above, it is decided to go on and perform an abdomino-perineal resection of the rectum in the usual manner, then the first stage is already complete.

The operation as here reported, which is being widely used in America now, but which is by no means new in principle (reviewed by Waugh and Custer, 1945), is made safe only by (i) careful selection of suitable cases, (ii) careful and controlled use of sulphasuccidine and sulphathalidine, and (iii) special attention to the suturing of the sigmoid colon to the stump of the rectum.

Choice of Cases.

In the presence of any obstruction no sutured anastomosis is contemplated without a preliminary colostomy; the blood supply of the colon is already so poor that its further impairment by distension makes sutured anastomosis too risky.

No anastomosis without a preliminary colostomy is attempted if the bowel at the time of operation is found to have been insufficiently freed of fæcal lumps by preoperative bowel wash-outs. If any fæcal lumps are present above the obstruction, a preliminary colostomy is performed so that the menace of possible mechanical disruption of the suture line can be removed before resection and anastomosis are attempted.

Consideration of the Site of the Growth.

Consideration of the functions of the anal sphincter muscle must precede a discussion on the desirability or otherwise of resection and anastomosis in the treatment of low as well as high rectal growths.

The external *sphincter ani* is under voluntary control and can be contracted at will. The internal *sphincter ani* is the "involuntary guardian of continence", and contracts automatically on coughing, sneezing and other acts which might precipitate outward passage of rectal contents through the anus. A number of American surgeons remove from above growths quite low in the rectum and anastomose as little as an inch-long stump of rectum to the upper part of the sigmoid colon. They claim that 50% of patients so treated are reasonably continent; but in these people continence depends on the action of the external sphincter, and they must keep their anal sphincter in voluntary contraction at times of stress—a somewhat unenviable task. It seems to be generally considered that resection of any growth less than 10 centimetres from the anal skin (allowing for removal of an inch below the growth) would impair the action of the internal sphincter in a sufficient number of cases to make the patient depend on the voluntary action of the external sphincter. Though continence is stated to be present in a number of these cases, my own observation of some of the results supports the opinion that growths under 10 centimetres from the anal skin margin are better treated by the usual abdomino-perineal incision.

The Use of Sulphasuccidine and Sulphathalidine.

It has been said that, by the use of sulphasuccidine or sulphathalidine, the large bowel can be treated in the same way as the small bowel, and anastomosed at will. This would appear to be dangerously far from the truth, though these drugs are a great addition to the armamentarium of the gastro-enterological surgeon. The blood supply of the colon is poor and it is the blood supply which brings about union at a suture line. Further, as has already been stated, the mechanical effect of any hard

fæcal material (fæces are rapidly dehydrated and rendered hard by the water-absorbing action of the colon) tends to disrupt the suture line, and any degree of obstruction impairs the circulation so as to make primary resection too dangerous. The main surgical indications for sulphasuccinyl therapy are therefore resection of the unobstructed colon and closure of a colostomy.

I have now used sulphasuccidine or sulphathalidine in seventeen cases.[1] While bacterial counts of stools have never shown a reduction to anything like the thousand colon bacilli per gramme of fæces claimed by some authors, a considerable reduction in the fæcal flora has been shown by bacteriological examination, and alteration in the character of the fæces to the yellow, slightly frothy "baby" stools described by many writers has been observed.

Both sulphasuccidine and sulphathalidine are less readily absorbed than sulphaguanadine; but notwithstanding this, during their use repeated white cell counts should be made to exclude the development of agranulocytosis.

Sulphasuccidine and sulphathalidine produce hæmorrhage from rectal or colonic growths or from the bowel in ulcerative colitis. Prolonged use of sulphasuccidine produced more hæmorrhages than sulphathalidine, and for a short time sulphathalidine was used in preference. More recent work has shown that these drugs diminish the absorption of all vitamins, including vtiamin *K*. This tendency to increase hæmorrhage is therefore diminished by the simultaneous hypodermic administration of vitamin *K*.

Both sulphasuccidine and sulphathalidine have different properties which make advantageous the employment of both at different and appropriate times in the management of patients who undergo rectal or colonic surgery. Thus the administration of sulphasuccidine results in thin, yellowish, frothy, diarrhœa-like stools (so-called "baby" stools), which "wash out" the bowel. This drug is therefore used before operation. Sulphathalidine has a more constipating effect than sulphasuccidine and produces a browner stool. It is therefore used after operation. My practice is to give both sulphasuccidine and sulphathalidine in a dosage of two grammes every four hours for four or five days before operation and for three or four days after operation.

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J. M. Waugh and M. D. Custer: "Segmental Resection of Lesions Occurring in the Left Half of the Colon with Primary End-to-End Aseptic Anastombosis", *Surgery, Gynecology and Obstetrics*, Volume LXXXI, 1945, page 593.

W. C. White and F. H. Amemdola: "The Advantages and Disadvantages of Closed Resection of the Colon", *Annals of Surgery*, Volume CXX, 1944, page 572.

[1] My experience with sulphasuccidine is as follows: colostomy, nine cases; subtotal colectomy, three cases; resection and anastomosis, five cases; removal of rectum, three cases.

Reviews.

CLINICAL NEUROLOGY.

"A TEXTBOOK OF CLINICAL NEUROLOGY" is written by J. M. Nielsen, Associate Clinical Professor of Medicine (Neurology), University of Southern California.[1] The author states that "the book aims to present the subject of clinical neurology working from the simple to the complex (from below upwards anatomically) in so concise and clear-cut a manner and in sufficiently small volume that it may be used as a text of the subject during the time allotted to neurology in a general medical course". Yet the text covers 667 pages, in spite of the absence of anatomical and physiological details.

Those responsible for the medical curriculum in each school find considerable difficulty in deciding how much time may reasonably be allotted to the various specialties, and in ensuring that the time allotted will be well spent. This involves the choice of textbooks which will aid in the making of the best graduate. In most schools it is considered desirable to teach the student the principles of general medicine and surgery; allotting to each specialty sufficient time for training in the commonly recurring and important conditions. Thus the medical course is designed in an attempt to produce the best standard of general practitioner and, at the same time, to establish a basis for post-graduate training and for the future training of specialists. Experience suggests that specialism undertaken too early produces an ill-balanced specialist. If he has sufficient time during his medical course, there is no doubt that the student will gain from a study of Nielsen's book. However, the number of years of study before graduation is limited.

The absence of anatomical and physiological details, and the emphasis placed upon "the radicular syndrome" contribute an element of originality of approach. A detailed description of the signs and symptoms produced by pathological lesion of the spinal nerve roots is used as a basis, during a systematic account of a number of diseases, for clear indication of the part played by involvement of these roots. The author modestly states: "My indebtedness for the information contained in the work is so extensive that I doubt whether there is anything original except the arrangement." He records the textbooks of clinical neurology to be found in his library. One regrets that the books of Wilson and Walshe are not amongst this collection, especially as the latter writes a very much smaller textbook "for the use of students and practitioners".

The space devoted to the description and the naming of the many syndromes of the brain stem will hardly be of value to the student. Nor is his sense of perspective maintained by statements such as are found on page 335: "Pontine lesions causing the various crossed hemiplegias (*hemiplegia alternans facialis, hemiplegia alternans abducentis*), and peduncular lesions resulting in the syndromes of Benedikt or Weber or Foix or Claude are frequently due to luetic vascular occlusion." Sometimes commoner conditions are not dealt with (for example, the encephalitis of rubella), whereas less common similar conditions are described.

Some of the clinical descriptions are excellent, although sometimes these are marred by an unnecessary intrusion of the dramatic, which may give a false sense of perspective. The tabetic patient "finds that he loses his balance when he closes his eyes. . . . He may discover that he cannot locate the pedals, by sense of position alone, in driving an automobile, and has to have a red light built in at the brake pedal and a green one at the clutch pedal so that vision can guide his feet". The failure to maintain a true perspective is sometimes obvious. "Occasionally a process which would be expected to produce (if anything) a polyneuritis results in several mononeuritides, usually in serum disease in which unilateral neuritis of the brachial nerves or a brachial plexus neuritis commonly develops." The tendency to particularize unnecessarily is observed in a number of places. Fasciculа-

[1] "A Textbook of Clinical Neurology", by J. M. Nielson, B.S., M.D., F.A.C.P.; Second Edition, Revised; 1946. New York, London: Paul B. Hoeber, Inc. 10" x 7", pp. 712, with 190 illustrations. Price: $7.50.

XUM

tion "may be present for only a few minutes or as long as two hours daily". "Rarely a child between the ages of twelve and fifteen will have a cerebral hæmorrhage from rupture of a congenital aneurysm within the cerebral substance." Occasionally contrary statements are made. On page 55 in regard to *herpes zoster*, it is stated: "The treatment of this condition has been unsatisfactory. For a time pituitrin injections were in vogue and it was said that if the injections were given early new lesions did not appear. I have seen such results in a few cases, but failures in many more." Yet on page 125 appears: "If the patient is seen early, just as the first vesicle is appearing, a hypodermic injection of pituitrin may prevent further vesicle formation and may even disperse the pain. This treatment is entirely empirical, but it is effective in a surprisingly high percentage of cases." Sometimes the mode of expression is bewildering, the writer's meaning not being immediately apparent. In dealing with neuritis he states: "The colon has been blamed by some writers in a high percentage of cases. In my experience there must be actual absorption of bacterial toxins, not merely the much over-emphasized 'auto-intoxication', before neuritis develops." Rarely an incorrect statement is made: "The posterior group [of intracranial aneurysms] are about the posterior communicating and the posterior cerebral arteries. This latter group, when they give symptoms, indicate the site by affecting the IX, X and XI cranial nerves."

Methods of investigation are only briefly described. The estimation of the protein content of the cerebro-spinal fluid in the patient suffering from the Guillain-Barré syndrome is hardly of sufficient importance to warrant repeated lumbar puncture. The author states that: "Repeated examination of the spinal fluid should be made, as the course of development of the disease or recovery from it may cause changes in the protein content."

Standard and modern methods of treatment are described, not always with a sufficient attempt at evaluation. In a book designed for students such an attempt seems very desirable. Surgical methods of treatment are merely indicated. It is somewhat startling to find the following description of the surgical treatment of intracranial aneurysms: "If diagnosis is made before rupture, various surgical procedures may be undertaken. Most of these methods are hazardous and are not often indicated. Small bits of muscle can be inserted into the internal carotid artery with the expectation that they will lodge in the aneurysm and organize it. Before such procedures are undertaken the diagnosis must be absolutely established, as evidenced by involvement of the optic nerve, erosion of bone, enlargement of one optic foramen, or by arteriography with a contrast medium by a neurologic surgeon."

The production of the book is good, of the standard type of most American textbooks. The illustrations are well chosen to supplement the text, and the index of a type dictated by common sense but not always found.

In spite of its lack of balance, resulting from an attempt to cover the whole field of neurology in a book sufficiently small to be of use to students, the text is eminently readable. The section upon clinical cerebral localization is excellent.

A YEAR BOOK OF PÆDIATRICS.

THE customary plan of the Year Book series is followed in "The 1946 Year Book of Pediatrics";[1] summaries of significant contributions to pædiatric literature are grouped under suitable headings and editorial comment is added where required. No separate editorial introduction or special articles are included as in some other volumes of the series. Indeed, the editorial material is notable for its brevity and sparseness; but it is always relevant and at times pithy, and is a valuable contribution to the book, helping to give balance and perspective to the varying views expressed. The grouping of subjects does not follow any conventional plan. Sections are allotted to the newborn, infant feeding, nutrition and metabolism, vitamins, infectious diseases and the individual physiological systems with separate treatments of poliomyelitis, tuberculosis and tumours; the concluding sections are on therapeutics and toxicology and a miscellaneous group. In the section on the newborn, two articles are cited bearing on the problem of congenital defects due to maternal infection with rubella, including one by Charles Swan and A. L. Tostevin, of Adelaide, which brings forward examples of congenital defect following other common infectious diseases in the mother. In the same section is a paper by Felix Arden, of Brisbane, which records recovery following rupture of the liver in a newborn child. There is also a discussion on jaundice in the newborn, a subject which, with associated and related conditions, receives a good deal of attention in the sections on the gastro-intestinal tract and the blood. Most of the papers in the section on infant feeding have to do with the detailed analysis of human milk; the vitamins and the nutritional and metabolic diseases are given adequate attention in their respective sections. The important subject of bowel infection in the infant and child attracts some notice, among the papers cited being three bacteriological studies by F. Draper, of Adelaide (one in association with Geraldine W. Brown). Prophylaxis, especially by serological methods, is extensively discussed in the section on infectious diseases, and prominence is also given to papers on the treatment of meningitis, including a survey of the results of penicillin treatment by Elizabeth K. Turner, of Melbourne. The problem of rheumatic fever is brought forward in papers from both England and America and some encouragement given to the use of sulphonamides for prophylactic purposes, especially against relapses. It is not practicable to give more than these few examples of the extensive literature summarized in this book, but there are matters of interest and value in it for all practitioners who have to do with infants or older children. The index to subject matter is thorough and the usual index to authors is included. The book is attractive in size, print and general production, and can be recommended to all who wish to keep abreast of the recent literature on pædiatrics.

[1] "The 1946 Year Book of Pediatrics", edited by Isaac A. Abt, D.Sc., M.D., with the collaboration of Arthur F. Abt, M.D.; 1947. Chicago: The Year Book Publishers, Incorporated. 7" × 4¾", pp. 464, with illustrations. Price: $3.75.

TOMOGRAPHY.

IN "A Manual of Tomography", M. Weinbren explains to the unenlightened that tomography, planigraphy, laminagraphy and stratigraphy all mean the same thing, namely, body section radiography.[1]

The author has divided his book into sections on tomography as applied to the chest, vertebral column, skull and facial bones, and larynx. A special chapter on miscellaneous regions includes sternum, hip joint and urography. A final chapter on technique completes a well-balanced monograph.

The advantages and indications for body section radiography of practically all parts of the body are very well set out and particularly well illustrated.

Whilst many radiologists will feel that an equally accurate diagnosis in many cases could have been made with first quality routine skiagrams, they will also agree with the author that in specially selected or difficult cases tomography will often result in more accurate and detailed information.

This manual should find a place in the library of a diagnostic radiologist. The specialists in chest diseases, throat diseases, orthopædics and neurology will find much of interest in the chapters dealing with their particular spheres.

Notes on Books, Current Journals and New Appliances.

A NOVEL ON BUSHRANGING.

MR. FRANK CLUNE, in his latest book, "Ben Hall: The Bushranger", attempts to give us not the story of Ben Hall's exploits as a bushranger, but the reasons which drove Hall to act as he did.[2] Therefore, although the book is based on historical fact, yet it is written in novel form. Mr. Clune fails to make his people come completely alive, and he does not go far below the surface in the study of their characters, but even so we understand the tragedy of a man who feels that he has a grudge against society. However, there are quite enough incidents in Hall's short outlaw life to make sufficient suspense and excitement for the reader. The bushranging days are part of our history, and sordid as were the lives of most of the bandits, yet a scent of romance still clings to their memory (who has not childish memories of "bobbies and bushies"?), so that there will be very few who do not find interest in this book.

[1] "A Manual of Tomography", by M. Weinbren, B.Sc. (S.A.), M.R.C.S. (England), D.R.C.P. (London), F.F.R. (London), D.M.R.E. (Cambridge); 1946. London: H. K. Lewis and Company, Limited. 10" × 7½", pp. 278, with 397 illustrations. Price: 45s. net.

[2] "Ben Hall: The Bushranger", by Frank Clune; 1947. Sydney, London: Angus and Robertson, Limited. 8½" × 5½", pp. 250. Price: 10s. 6d.

The Medical Journal of Australia

SATURDAY, JUNE 21, 1947.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

A REPORT OF "B.C.G." VACCINATION.

A GLANCE through the indices of this journal for the last ten years will show that a great deal of space has been devoted in every volume to tuberculosis. By far the most important aspect of the subject is that of prevention, and intimately bound up with it is the problem of diagnosis. The work of Reginald Webster on the cultivation of the tubercle bacillus—the mycobacterium of tuberculosis, to give the organism its modern name—and its isolation from the gastric contents of suspected sufferers has been of the greatest importance and value, particularly in the examination of recruits to the armed forces during the war. Among others whose writings have traversed the subject have been Hilary Roche, D. J. Anderson, H. W. Wunderly and D. R. W. Cowan. Mention should also be made of a report on tuberculosis in America by Douglas Galbraith, an abstract of which was published in this journal in February, 1941. Those who have followed these writers in their studies should have a good idea of the complexity of the problem and of the way in which its solution should be attempted. Though a great deal of work has been done, the whole ground has not been covered and unanimity has not been reached in regard to the significance of the investigations that have been reported. For this reason it is most important that the interest of every one concerned in the fight against tuberculosis should be maintained at the highest possible level. As stated a week or two ago in these columns, this is all the more necessary in this country because the Commonwealth Government has shown its concern by appointing a Commonwealth director of tuberculosis in the person of Dr. H. W. Wunderly and also because a full dress discussion on the whole subject of pulmonary tuberculosis will take place at the plenary session of the Perth Congress in August of next year.

The United States Public Health Service last year devoted several issues of its *Public Health Reports* to different aspects of the control of tuberculosis. In one of these there has been published an account of the amazing results that have been achieved in Denmark. It is our intention to bring this report in some detail to the notice of readers of this journal, for they will find in it an explanation of points about which they may have been in doubt or which have possibly not been presented to them before from the practical point of view. Much of the success attained has been the result of vaccination with the *Bacille Calmette Guérin* vaccine, more commonly known as "B.C.G." vaccine. Before an attempt is made to describe what has been done in Denmark in the matter of control, it is therefore necessary to set out some of the results of "B.C.G." vaccination. These are described by Johannes Holm, chief of the tuberculosis division of the State Serum Institute, Copenhagen, and advisory consultant of the tuberculosis control division of the United States Public Health Service.[1] In Denmark "B.C.G." vaccination of man has been carried out since 1927. In the earlier years, however, it was used merely as an experiment. In 1940 it was first used extensively and latterly has been adopted as an essential weapon in the fight against tuberculosis. Holm explains that difficulties were at first experienced in obtaining vaccine from a strain of organisms of suitable virulence, one that would not produce abscesses and ulcerations which followed the use of the strains at first employed. When a strain of suitable virulence was obtained which on intracutaneous injection did not produce too large local reactions and gave rise to but few complications, it still showed some variation in virulence in the course of years. The constancy of the virulence of the "B.C.G." strain for the production of vaccine was maintained by growing it on Sauton medium, with subcultivation about every two weeks. When the strain manifested periodical weakening other corrective measures were adopted. The important point is that the virulence of the strain shall be kept at such a level that practically all vaccinated subjects become reactors to tuberculin and preserve their sensitiveness to it for as long as possible, and that the local reaction at the site of vaccination is prevented from becoming too intense and the regional glandular involvement too extensive. Before vaccination is begun it is necessary to determine that the individual concerned does not react to tuberculin. For this purpose he is subjected to a Mantoux test. If the subject has been exposed to tubercle bacilli within six weeks, vaccination is not performed immediately after failure to react to tuberculin because of the possibility of his being in a preallergic phase. Therefore after six weeks the Mantoux test is repeated, and again if no reaction occurs vaccination is then performed. Normally the vaccination is followed after four or five weeks by the appearance of a small nodule at the site of vaccination. This slowly increases in size, and after about a week it perforates the skin, it discharges one or two drops of pus and forms a small ulcer that heals after a few weeks, leaving a tiny scar. Normally the regional glands are not demonstrably enlarged. The size of the lesion varies, even with use of the same vaccine; the size increases with a vaccine of increased virulence. With an infiltration whose diameter varied mostly from five to fifteen millimetres, the vaccine in one series that is quoted by Holm was so potent that more than 97% of subjects reacted to tuberculin six to nine weeks after the vaccination.

[1] *Public Health Reports*, September 6, 1946, page 1298.

Every person in Denmark who is examined for tuberculosis is subjected to a tuberculin test; the Mantoux test is always used and everywhere the same tuberculin dosage and the same dilutions are employed. Great differences in the percentage of reactors are found in different parts of the country. The percentage of reactors is considerably higher in districts in which a great deal of tuberculosis is present among cattle than in districts in which the cattle are nearly or entirely free from the disease. At the age of fourteen years about two-thirds of the Danish population are non-reactors to tuberculin, and even at the age of twenty to twenty-three years one-third of the population still fails to react. In these circumstances there has been ample opportunity to investigate the course of primary tuberculosis infections in adults. Holm makes comparisons between tuberculin reactors and non-reactors exposed to the same degree of infection and claims to show that the danger of exposure to tubercle bacilli is considerably greater for the non-reactors than for the reactors. This view, which is widely accepted, does not find favour with all workers in this field. J. A. Myers, professor of medicine in the University of Minnesota, writing on the establishment and use of fundamental procedures in tuberculosis control,[1] produces evidence that makes him conclude that the theory that a first infection postponed to adulthood is exceedingly hazardous is untenable in Minneapolis. He believes that the longer an infection is postponed, the better. Holm refers to an investigation, undertaken in Copenhagen by Sigrid Holm, of inverters (non-reactors to tuberculin who become reactors within a certain period) in support of his contention. In regard to the duration of the positive reaction to tuberculin after "B.C.G." vaccination, data have been obtained because an attempt was made to subject all vaccinated persons to a tuberculin test once a year. It has been found that the great majority of vaccinated persons will react to tuberculin even four years after vaccination. It is now believed justifiable to wait for as long as three or four years before performing tuberculin tests on persons who are not exposed "more than normally" to tuberculosis. At this time those who do not react can be revaccinated. Complications have been fewer when the vaccination was done by a trained vaccinator than when it was done by a general practitioner. Complications occurred in 26 cases among a total of 3,369, and consisted chiefly of excessive suppuration at the site of the vaccination.

The protective effect of "B.C.G." vaccination is the most important aspect of the subject. Holm states that without doubt vaccination does afford protection against the morbid conditions resulting from primary tuberculous infection. The chief question, however, is whether the vaccination also affords protection against genuine pulmonary tuberculosis. Holm's observations show beyond question that it does give a considerable degree of protection. In the tuberculous milieu in which the vaccination has been carried on, all children failing to react to tuberculin have been vaccinated and the newborn have also been vaccinated. When they have yielded a reaction after vaccination they have been allowed to associate with the source of infection at home. This is, as Holm observes, a severe test, yet it has been found that tuberculosis morbidity and mortality have been reduced almost to nothing after systematic vaccination has been carried through. Previously mortality from tuberculosis was high in this milieu, but "in recent years no children so exposed have died of tuberculosis; and those children who become ill have a much milder form of tuberculosis than that previously observed". Experiences gained on the island of Bornholm should be mentioned. This island has a population of nearly 50,000 people and its cattle have been entirely free from tuberculosis for twenty years. The percentage of tuberculin reactors has been very low on the island during recent years. Observed cases of tuberculosis occurred chiefly in young people who did not react to tuberculin. This applied chiefly to non-reactors who left the island for some other part of Denmark; a good many returned to the island with tuberculosis. Since 1937 all non-reactors leaving the island have been urged to submit to vaccination, and since 1940 all non-reactors residing on the island have as far as possible been vaccinated. For the years 1936-1940 the age distribution of all persons with new recognized tuberculous infections was the same for all Denmark—most new infections were found in the thirteen to thirty-five year age group. For the next five-year period, 1941-1945, there was a very considerable reduction in the cases of tuberculosis in the fifteen to thirty-five year age group—"a decrease which must be ascribed to extensive BCG vaccinations in these age groups". Again, observations have been made on a group of university students. The incidence of tuberculosis was far greater among non-reactors to tuberculin than among reactors, and no case of tuberculosis was encountered among a group (175 in number) who had been vaccinated with "B.C.G.". Another example quoted has to do with a teacher working in a basement that had been transformed into an air-raid shelter. In the classes taught by this teacher an unusually high "inversion" percentage of 85 was observed. An influenza-like illness broke out among the pupils—it was a tuberculous infection and it occurred exclusively among the pupils who had not reacted to tuberculin; no instance occurred among those who had been vaccinated with "B.C.G.". Here, as Holm points out, is strong proof of the protection given by vaccination against the complications of a primary infection. Observations in the following three years showed that of the original non-reactors one died of tuberculosis and six acquired genuine pulmonary tuberculosis. Among the original tuberculin reactors six cases of genuine pulmonary tuberculosis appeared, two of them among those who were vaccinated. Here the conclusion is that "B.C.G." vaccination gave at least as effective a protection against genuine pulmonary tuberculosis as did the natural infection.

The conclusion to be drawn from the work that has been summarized is that vaccination with "B.C.G." is safe. Obviously close attention must be paid to the virulence of the strain of "B.C.G." that is used, for variations may occur. It is also clear that some experience is needed in the actual vaccination if the best results are to be obtained. Lastly vaccination gives a high degree of protection—almost complete against primary infection and considerable against "genuine tuberculosis of the various organs". On another occasion the present control of tuberculosis in Denmark will be described, and in this "B.C.G." vaccination will be found to take an important part.

[1] *Public Health Reports*, November 1, 1946, page 1563.

Current Comment.

ANTERIOR POLIOMYELITIS.

THE problem of acute anterior poliomyelitis and its complications has always been a serious one in the United States and studies based on the extensive clinical material in that country are usually of interest. Two recent papers are devoted to aspects of the disease which have received relatively little attention.

In the first of these, Edward M. Bridge, Gene H. Clarke and Doris Abbe have considered whether an attack of poliomyelitis confers an immunity which is sufficient to protect a person against subsequent infection.[1] They present details of six cases of a second infection occurring during an epidemic in Buffalo in 1944. The clinical findings in the case of four of the patients present definite evidence of repeated infection; in the other two it is probable. The difficulty of making a positive diagnosis in the "abortive" form of poliomyelitis suggests that the incidence of six cases is a minimal figure. The total number of patients infected in this 1944 epidemic was 1,058, and a reinfection incidence of six seems, at first sight, too small to be significant. However, by considering the total epidemic incidence and the incidence over the previous twenty years, the authors argue, in an ingenious piece of statistical reasoning, that a reinfection incidence of six is actually greater than would be reasonably expected if it is assumed that no clinical immunity had been acquired from previous infection. This evidence against the acquirement of clinical immunity in man is supported by experimental findings in laboratory animals; second attacks in monkeys have been induced by various workers since as early as 1913. Previous reference to this experimental work was made in this journal on July 3, 1937. Much more work remains to be done on this difficult problem, the findings so far being essentially negative; but it seems clear that we must agree with these investigators that, in the management of cases of the disease as well as of epidemics, it appears inadvisable to rely on acquired immunity to protect persons who may be in close contact with patients.

The second investigation concerns the affection of the heart by this disease. William I. Gefter, William G. Leaman, Pascal F. Lucchesi, Irene E. Maher and Milton Dworin have recorded[2] the results of cardiac investigations of 467 patients treated for acute poliomyelitis in Philadelphia from 1943 to 1945 inclusive. The clinical findings among the 456 patients of the series who survived were not in themselves sufficient to warrant a diagnosis of myocarditis—a negative finding of significance in view of further considerations. Electrocardiograms were analysed in 226 of the 456 surviving cases, abnormalities appearing in 32 instances (14·2%). The changes were neither uniform nor specific and required careful and conservative appraisement, but were sufficient to indicate the presence of myocardial derangement. There was a significant correlation between the frequency of electrocardiographic abnormalities and the clinical severity of the disease. The abnormalities tended to occur early in the disease and frequently persisted for several weeks. Autopsies were performed in six of the eleven fatal cases and revealed pathological changes in the myocardium in five out of the six hearts. Electrocardiograms had, unfortunately, not been obtained from any of these patients because of their grave condition; but it is important to note that, in the patients whose myocardium was found to be abnormal *post mortem*, the clinical findings were of little significance and, in two instances, were normal. Cyanosis was present in all cases including that in which the heart showed no abnormality *post mortem*, and was probably due to respiratory paralysis. The important inference from this investigation is that the myocardium is not infrequently affected in this disease, especially in its more severe forms, and that clinical examination may not reveal an existent myocardial abnormality. Electrocardiographic examination is helpful, more information being obtainable from serial than from isolated tracings. The possibility of cardiac involvement needs always to be borne in mind by the clinician and, if at all possible, electrocardiographic investigation should be made of all patients showing cardiac abnormalities clinically, no matter how slight the abnormality may be.

[1] *American Journal of Diseases of Children*, November, 1946.
[2] *American Heart Journal*, February, 1947.

THE MENTAL HOSPITALS IN NEW SOUTH WALES.

THOUGH readers of this journal must be wearied and perhaps bored with the frequent references in the editorial pages of this journal to the mental hospitals of the several States of the Commonwealth, the subject is one that must constantly be brought forward. The story is always one of deficiencies, of overcrowding, of good intentions and of disappointments. The mental hospital departments issue their reports and the general public hears little if anything about them. If the deficiencies of the mental hospitals achieved a place in newspaper headlines commensurate with their importance to the public, something would happen much more quickly than it does and the avowed good intentions of the powers that be would not fade away into nothingness. It is in the hope that the publicity which this journal can give among medical readers will extend beyond medical circles that the subject is once more broached. This time the report of the Inspector-General of Mental Hospitals of New South Wales calls for mention. The latest document deals with the year ended June 30, 1945. It was ordered to be printed on August 27, 1946, and a copy was received on May 26, 1947.

It is not our intention to review the whole report, but to draw attention to those facts and statements of opinion which should be made known, for the sake of the well-being and comfort of the unfortunate patients who cannot speak for themselves. The patients in residence, including voluntary patients and inebriates, at the close of the year under review numbered 10,954. Accommodation was available for 9,055. Overcrowding therefore existed to the extent of 1,970 patients. This is not the greatest number of patients in excess of accommodation that has been recorded through the years; the peak was reached in 1941-1942 with 2,323. It is, of course, possible that we should be thankful that past records have not been exceeded. The Inspector-General is more optimistic than most other people would be, and, we would suggest, than he is justified in being himself. He writes:

> It is anticipated that in the very near future the overcrowding in mental hospitals will be eliminated, when schemes submitted to the Government for the provision of a new metropolitan hospital, another hospital of the farm colony type and a convalescent hostel can be carried out.

Under the heading "General Care of Patients" we read:

> Owing to existing circumstances, i.e., the great shortage in female nursing staff and the absence of a number of the male nursing staff on military duty, also the serious overcrowding in mental hospitals generally, it has not been possible to give the patients the efficient care and supervision which has been the standard in previous years. However, it is expected this difficulty will be overcome when the staff conditions return to normal and the works referred to previously in this report can be carried out.

With the Inspector-General, we expect that difficulties will be overcome when a state of normality is reached once more. This waiting period will without doubt be long.

A third point must be mentioned. We are told that electric shock therapy machines are gradually being installed in the mental hospitals under the control of the department as they become available, and "it is hoped in the near future that every hospital will be so equipped". We cannot help wondering how strenuous have been the efforts to discover available machines that should have been in place long ago and whether staff difficulties have not damped these efforts a little.

Having mentioned these three aspects of the Inspector-General's report, we commend them to readers for discussion and wide promulgation.

Abstracts from Medical Literature.

BACTERIOLOGY AND IMMUNOLOGY.

Blood and Bone Marrow in Infectious Mononucleosis.

LOUIS R. LIMARZI, JEROME T. PAUL AND HENRY G. PONCHER (*The Journal of Laboratory and Clinical Medicine*, October, 1946) have made a review of the literature and a report of the blood and bone marrow in 25 cases of infectious mononucleosis. They classified the mononuclear cells of the blood in the three types described by Downey; the heterophile antibody test was not performed in six cases, and failed to give a reaction in six cases included in the series. The cellular picture in the peripheral blood showed an average of 64% abnormal lymphocytes of Downey types I and II, together with a myeloid leucopenia. The sedimentation rate in sixteen cases was as high as 41 millimetres per hour. The marrow counts and smears suggested a hyperplastic activity and a state of immaturity and some degeneration of the cells. The proportion of lymphoid cells in the marrow was slightly increased, but did not approach that seen in lymphatic leuchæmia, and marrow biopsy showed clearly a difference between infectious mononucleosis and lymphatic leuchæmia. The authors postulate that a toxic agent suppresses granulocyte maturation in the marrow, and that the reticulum of other parts of the erythropoietic system attempts to compensate the lowered white cell count in the peripheral blood, and thus produce the picture of infectious mononucleosis.

The Effects of Lipids and Serum Albumin on Bacterial Growth.

RENE J. DUBOS (*Journal of Experimental Medicine*, January, 1947) extends his studies of the effects of lipids and serum albumin on bacterial growth. Pure fatty acids, their esters, and commercial preparations containing fractions of each were tested above and in combination with serum albumin. The test organisms were a micrococcus isolated in the laboratory and an avian and a human strain of mycobacterium, and the medium was semi-synthetic. The higher concentrations of oleic acid completely inhibited growth, while the addition also of 0·5% albumin completely neutralized the effect of the acid. Esterification of the acid also removed the toxicity. Growth in the medium with albumin was slight, but increased with the addition of oleic acid or ester; the micrococcus, however, needed larger amounts than the mycobacterium. Substances in the medium were then investigated for their effect, and it was found that the presence or absence of glucose had no effect on cultures of tubercle bacilli, but was essential for the micrococcus, while absence of casein hydrolysates affected markedly the growth of the mycobacterium. Similar conclusions were arrived at in solid media where measurement of fully grown colony size was recorded. The author investigated the chemical affinities and reactions of the substances concerned and the possibility of their alteration by enzymes contained in serum if it was used as the source of albumin; perhaps a non-toxic ester might become toxic during incubation. The role of the fatty acids in the metabolism of the two type organisms appeared to be very different, the micrococcus possibly using them as catalysts, the mycobacteria as metabolites. The author also suggested that the sensitivity of these organisms to fatty acids might possibly be adapted in a method of biological assay of these substances.

Aerobic Streptococci from Uterus and Vagina.

K. EILEEN HITE AND H. C. HESSELTINE (*The Journal of Infectious Diseases*, January-February, 1947) made a study of the aerobic streptococci isolated from the uterus and vagina. Hæmolysis was observed on 3% sheep blood agar, heat resistance was tested at 60° C. for thirty minutes, tolerance of medium containing 6·5% sodium chloride was tested, together with a wide variety of fermentation reactions, and an attempt made to test sensitivity to penicillin. This was difficult with slow growing strains and necessitated observation for seventy-two hours. Sixteen of the seventeen hæmolytic strains were killed at 60° C. and could not survive in 40% bile blood agar; fifteen produced ammonia from peptone, thirteen grew at 10° C., and the fermentation of carbohydrates was variable. The majority produced a pH of 4·2 to 4·4 in dextrose broth. Eight streptococci in this group resembled to some degree the enterococci; the remainder resembled pyogenic organisms of group G. From the 57 cultures which were non-hæmolytic, there emerged one group resembling enterococci, another resembling *Streptococcus viridans*, and an indeterminate group. Of the hæmolytic group, ten were inhibited by 0·1 unit of penicillin or less, three by 0·5 unit and three by 1·0 unit. Of the non-hæmolytic cultures, the first group were uniformly resistant to anything less than five units per millilitre, while the other two groups varied below 0·5 unit per millilitre. The authors discuss the Sherman classification of the streptococci and the significance of the results of their penicillin sensitivity findings in relation to the treatment of patients.

Infection with Bacillus Anthracis.

W. J. CROMARTIE, W. L. BLOOM AND D. W. WATSON (*The Journal of Infectious Diseases*, January-February, 1947) report a series of studies on infection with *Bacillus anthracis*. The first was a histopathological study of lesions produced in susceptible and resistant animal species. Two strains of the organism were used, one more virulent than the other, as shown by their experiments. Mice, guinea-pigs and rabbits were susceptible, and, after intracutaneous inoculation of graded doses of spore suspensions, developed acute disease fatal in ninety-six hours or less. Rats inoculated with the weaker strain, and swine and mongrel dogs with either strain developed a more chronic condition from which they tended to recover. All animals had characteristic local lesions, and sacrifice of members of groups at different times showed that there was rapid development from spore to capsulated vegetative form in two to four hours, œdema and swelling of tissues, and hæmorrhage at the centre going on to necrosis. By this time susceptible animals were very ill, the numbers of organisms increasing, and death of the host followed; the local lesions showed varying stages of necrosis and polymorphonuclear infiltration of the ulcer. The resistant animals on the other hand showed organisms which seemed to lose their capsules, fragment, alter in staining property, and cease to multiply; large numbers of polymorphonuclear cells appeared, though phagocytosis was not frequent; regenerative fibrous tissue also appeared, and remaining organisms tended to be agglutinated together in the extracellular fluid. The second paper records the immunological and tissue damaging properties of extracts prepared from the lesion of *Bacillus anthracis* infection. Large lesions were produced by suitable doses of spores introduced intracutaneously, and after forty-eight to ninety-six hours, when the animals were moribund, they were sacrificed; the œdematous tissue was excised and frozen, and then extracted to saline solution at low temperature—the extract was filtered and tested for sterility. It usually contained about 1% protein. Histological studies were made of the tissue damaging properties of the extract; groups of animals were injected weekly with different doses of extract and, after three injections, challenged by an injection of living spores; sections of skin twenty-four hours after injection of extract showed similar changes to those following injection of spores and all animals so treated survived, showing that the extract stimulated a protective mechanism. This finding was tested further by arranging a test of respiratory infection, and again protection by the extract was demonstrated. Finally lesions were produced by injection of extract into normal and immunized animals, and the histological picture was studied. The normal animals behaved as already described, while, in the immunized ones, there was little œdema, the bacilli did not multiply rapidly and soon began to fragment, and although many polymorphonuclear cells were present there was little evidence of phagocytosis; slow healing was followed up to twenty-two days, a central dry eschar being present. Mice showed a little variation from this picture, and some died with a small local lesion, but with general lesions similar to those in normal mice. These experiments showed that a diffusible substance developed in the extracellular tissues, and that in the immunized animals a mechanism developed which retarded capsule development by the bacilli. The third paper considered chemical and immunological properties of the protective antigen in crude extracts of skin lesions of *Bacillus anthracis*. The crude extracts were studied in the Tiselius apparatus; record was made of the electrophoretic pattern, in which the extracts were shown to be similar in behaviour to normal rabbit serum except for a substance migrating at pH 8·10, which could be precipitated by calcium phosphate. Tests for tissue damaging and immunizing properties of precipitates and supernatants showed that there were two different substances concerned. Further fractionation showed that the protective antigen migrated in the electrophoretic cell between the gamma and beta globulins; it was shown to be heat labile, but to withstand 1·0% formalin solution and lyophilization; it was destroyed by trypsin and was not stable at pH below

4·0. Attempts to concentrate the antigen were only partially successful with 25% alcohol. Immunization of a variety of animals including hamsters and sheep and protection against a challenge dose were demonstrated. Hyperimmune sera were prepared from animals which had survived challenge inoculations, and precipitin and complement-fixation reactions could be obtained by using the crude antigen; but no direct relationship between these and the protective antibodies could be shown, and this persisted after absorption of the sera. The fourth paper described the preparation and characterization of an anthracidal substance from various animal tissues. Previous study of tissues had shown that organisms near leucocytes became granular and degenerated, this fact suggesting that some substance had developed interfering with bacterial growth. This substance was present in leucocytes and could be inhibited in its action by the crude extract of tissue used in other experiments. Attempts failed to identify the substance with enzymes such as lysozyme or ribonuclease. Different tissues were tested for content of the anthracidal factor, and hog pancreas and calf thymus, spleen and lymph node were found to yield considerable amounts. A method was developed for preparing it, and chemical analyses were made which showed it to be a basic polypeptide containing a considerable amount of lysine. Therapeutic tests showed a 48% survival of animals receiving treatment by the anthracidal substance, while all the controls died. No toxic symptoms were seen in the surviving animals. The role of this substance in natural resistance and its release from leucocytes and lymphoid tissue is discussed.

HYGIENE.

DDT and Other Insecticides in the Control of Fleas.

R. W. KERR (*Journal of the Council for Scientific and Industrial Research*, August, 1946) has conducted a series of laboratory experiments on the control of fleas with DDT and other insecticides. Cat fleas were reared in the laboratory from flea eggs obtained from a young kitten by a method described. It was found that DDT used in dust form did not prevent the development and hatching of eggs of the cat flea. A dust consisting of one part DDT to ten parts of pyrophyllite killed newly hatched and large flea larvæ when mixed with the larval medium at the rates of 0·5% and 0·01% of DDT. Surface dusting of the medium at the rates of 50 and 30 milligrammes of DDT per square foot killed all larvæ within twenty-four hours. DDT dust, 5%, when applied at the rate of 50 milligrammes per square foot, was highly effective against adult fleas. Adult fleas were killed by contact for periods of one minute or more with a glass surface bearing a dry deposit of 50 milligrammes of DDT per square foot. DDT impregnated into calico and filter paper at a concentration of 50 milligrammes or more per square foot killed all fleas exposed for thirty minutes. Under the same conditions, 93% of fleas died after contact with DDT at a concentration of 20 milligrammes per square foot. At this low rate of impregnation, DDT was considerably more effective and persistent as a contact insecticide than thanite, lethane 384, *p*-dichlorbenzene and naphthalene, all at 50 times the concentration of DDT. The lethane deposit produced the most paralysing action, but its lasting qualities were poor in comparison with those of DDT. It has been shown that DDT is not absorbed through the skin of mammals; however, the ingestion of large amounts can cause poisoning and even death.

Streptococci from Carriers.

ROBERT M. PIKE (*The Journal of Infectious Diseases*, September-October, 1946) has made a study of group A streptococci from healthy carriers and has paid particular attention to mucoid polysaccharide production. The study developed in a search for a difference between the organisms found in 75% of healthy children and those isolated from patients. Capsule formation, colony morphology, and fermentative pattern were also studied. Polysaccharide was estimated quantitatively in a photo-electric cell, compared with a standard of pure hyaluronic acid, and the turbidity recorded as milligrammes of polysaccharide per 100 millilitres of broth. Two hundred and eighty-three strains from various sources were studied, and 174 of these produced more than one milligramme of hyaluronic acid, of which 116 also exhibited capsules. One hundred and nine strains produced less than one milligramme and 106 had no capsules. Observations of colony morphology on solid and liquid media correlated much less accurately with polysaccharide production than did capsule formation. Analysis of strains into groups from carriers and patients did not reveal any significant differences by any of these investigations.

A Survey of Dishwashing Practice.

H. J. KLEINFELD AND L. BUCHBINDER (*American Journal of Public Health and the Nation's Health*, April, 1947) have made a survey of dishwashing practice and effectiveness in a thousand restaurants. A total of 3,657 swab samples was secured from 1,005 restaurants. About 88% of establishments used hand methods either entirely or in part and 17·5% used machine methods entirely or in part. The quality of washing as measured by a swab-rinse test was found in general to be very poor. The authors present evidence which indicates that unsatisfactory conditions are not peculiar to New York, but exist also in other sections of the country. Hand-washed glasses and cups met the bacterial standard of less than 100 colonies per utensil in 10·5% of cases (176 of 1,675 samples); the analogous figure for the same utensils washed by machine was 35·8% (509 of 1,421 samples). Although these figures are in favour of the machines, the authors state that, since only about two-fifths of machine-washed samples passed, much improvement is needed both in the design and in the operation of machines. Hand-washed spoons and forks were found to pass in 35·8% of instances. This percentage, it is pointed out, is higher than that for hand-washed cups and glasses and is equal to that for machine-washed spoons and forks (35·4%). It was noted that only about 5% of silverware samples which were washed by hand came from establishments which actually made a serious attempt to "sanitize" these utensils properly. The findings with this group of samples were about 50% better than those from the remaining 96% of samples which came from establishments in which less care was exercised. Another small group of samples which had been washed by a special silverware machine yielded a passing percentage which was about twice as good as the general average for machine washing. The authors conclude that hope for satisfactory dishwashing practice lies in conversion to machine or manual-mechanical practice and the intelligent operation of the equipment.

W. L. MALLMANN, P. DE KONING AND L. ZAIKOWSKI (*ibidem*), in the course of a critical study of dishwashing from the bacteriological point of view, suggest that for single tank dishwashing machines a rinse period of ten seconds should be used and a temperature of 170° F.

Paratyphoid B Fever in a Nursery.

A. R. FOLEY (*Canadian Journal of Public Health*, February, 1947) describes an outbreak of paratyphoid B fever occurring in the nursery of a small hospital. The infants were not very sick, but passed numerous greenish stools. The exact nature of the epidemic was not suspected until it was investigated by the local county health unit and cultures were made from stools. Control measures were immediately instituted and no further cases occurred within the institution. Further cases, however, occurred in the families of babies who had already gone home. It was considered likely, though not fully established, that a woman admitted for delivery was the source of the epidemic. The author states that the epidemic proves the necessity for bacteriological examination of stool specimens in any diarrhœal outbreak. He adds that if this had been done when the sick woman who was regarded as the carrier was admitted to hospital, many infections would have been avoided; and babies would not have left hospital to act as carriers to their families. The infection cleaned up quickly in adults, but 37·5% of babies remained carriers.

Air Sterilization by Ultra-Violet Light.

REGINALD A. HIGGONS AND GERTRUDE M. HYDE (*New York State Journal of Medicine*, April 1, 1947) discuss the installation of ultra-violet lamps into a children's hospital in New York in an effort to overcome epidemics of acute respiratory infections within the institution. Practical aspects of making such an installation are considered and the hospital's experience is described. Statistical details are presented of the incidence of acute respiratory infections. From their observations the authors concluded that contagion due to direct mouth to mouth contact between ambulatory children at play could not be prevented by the use of ultra-violet air sterilization. They consider that this very intimate type of contact which goes on all the time in an "indwelling" children's institution, probably accounted for the incidence of respiratory disease noted during the years of the experiments. However, they are convinced that the lights effectively prevent the air-borne distant spread of infection, thereby preventing mass epidemics among the inhabitants of such institutions. They feel that the results justify the cost of ultra-violet lamp installation in institutions such as children's hospitals.

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Bibliography of Scientific and Industrial Reports.[1]

THE RESULTS OF WAR-TIME RESEARCH.

During the war a great deal of research was carried out under the auspices of the Allied Governments. It has been decided to release for general use a large proportion of the results of this research, together with information taken from former enemy countries as a form of reparations. With this end in view, the United States Department of Commerce, through its Publication Board, is making a weekly issue of abstracts of reports in the form of a "Bibliography of Scientific and Industrial Reports". This bibliography is now being received in Australia, and relevant extracts are reproduced hereunder.

Copies of the original reports may be obtained in two ways: (a) Microfilm or photostat copies may be purchased from the United States through the Council for Scientific and Industrial Research Information Service. Those desiring to avail themselves of this service should send the Australian equivalent of the net quoted United States price to the Council for Scientific and Industrial Research Information Service, 425, St. Kilda Road, Melbourne, S.C.2, and quote the PB number, author's name, and the subject of the abstract. All other charges will be borne by the Council for Scientific and Industrial Research. (b) The reports referenced with an E number may be obtained in approved cases without cost on application to the Secondary Industries Division of the Ministry of Post-War Reconstruction, Wentworth House, 203, Collins Street, Melbourne, C.1. Copies of these are available for reference in public libraries.

Further information on subjects covered in the reports and kindred subjects may be obtained by approaching the Council for Scientific and Industrial Research Information Service, the Secondary Industries Division of the Ministry of Post-War Reconstruction, or the Munitions Supply Laboratories (Technical Information Section), Maribyrnong, Victoria.

PB 20819. FORSCHUNGSINSTITUT FÜR CHEMOTHERAPIE. *Verfahren zur Herstellung von Toxin oder Endotoxin-freien oder Toxin oder Endotoxin enthaltenden Impstoffen zur aktiven Immunisierung.* (Method of manufacturing vaccines containing toxins or endotoxins for active immunization.) (German patent application F 88871.) (ALSOS Mission, MF 11Bb.) March, 1945. 4 pp. Price: Microfilm, 50c.; Photostat, $1.00.

This patent application describes a new method of preparing active vaccines which may be used in bacillary dysentery *et cetera*; they are made from both endotoxin-free bacterial cultures and cultures containing endotoxins. Eight claims pertaining to the method are listed. In German.

PB 34019. SHONE, W. R., *et alii.* German surgical and veterinary instrument industry. (BIOS Final Report 399, Item 9, 24.) December, 1945. 77 pp. Price: Microfilm, $2.00; Photostat, $6.00.

This report on the German surgical and veterinary instrument industry is based on information secured by a team of five representatives from the industry in the United Kingdom, the Government of India and the British Directorate of Medical Supplies, who in October-December, 1945, visited the eighteen surgical and one veterinary instrument plants still standing in the American, French and British zones of Germany, for the purpose of examining and reporting on German production methods, technical developments, and other matters of interest to British industry. Interviews with all the key personnel in the plants visited, most of them in the areas of Tuttlingen and Solingen, are contained in the report. Most of the information in the *résumé*, however, is based on observations in the plant of Jetter and Scheerer, the largest organization in Germany devoted entirely to the manufacture of surgical instruments.

PB 41236. ASH, H. W., *et alii.* German dental industry. March-April, 1945. (BIOS Final Report 630, Item 24.) August, 1946. 77 pp. Price: Microfilm, $2.00; Photostat, $6.00.

This report covers an investigation of certain German dental manufacturers selected by the Association of Dental Manufacturers and Traders of the United Kingdom following a visit of CIOS Team 717 in August, 1945. Their report (CIOS No. XXX-95; PB 1048, v. 1, p. 142) dealt in some detail with the products and general organization of the firms visited by Team 1950 (except Berlin firms). The present team accordingly concentrated upon obtaining information regarding methods, processes and manufacturing formulæ which had not been reported by the previous team. The report covers visits to 21 factories, and concludes that under the conditions existing at the time of the investigation, the German dental industry was not then able to produce sufficient goods to meet its own demand, but that given sufficient labour and materials, its potential capacity is considerably greater than the internal German requirements. The investigation also confirmed that there had been very little new development in materials or designs since the beginning of the war. The report is divided into eight sections, each dealing with a separate branch of the industry. The body of the report is confined to the methods and processes investigated and general information based on data from individual factories is given in tabular form at the end of each section. This includes information regarding labour, rates of pay, prices, output *et cetera*. Lists of equipment and drawings requested for evacuation, lists of samples of materials and specimens of products obtained, formulæ, and drawings and diagrams are included.

PB 37136. SCHÜTZE, U. *Untersuchungen über den Einfluss hoher Windgeschwindigkeiten auf den Kopf.* (Examination of the influence of high wind velocities on the head.) (*Deutsche Luftfahrtforschung* FB 1303.) November, 1940. 25 pp. Price: Microfilm, $1.00; Photostat, $2.00.

This report describes the tests in wind tunnels and in aircraft to determine the effect of the high atmospheric pressures coincident with the speed of modern aircraft on the human head. The tests were undertaken on model heads without eye protection, with and without protective head boards, in wind tunnels at speeds to 250 km./h., on unprotected human beings in aircraft at speeds to 500 km./h. and on goggle protected model heads at speeds to 900 km./h. (sea level). Tests on the unsupported head indicate good average compatibility at atmospheric pressures to 1,130 kg./m.^{2} and at speeds of 500 km./h. at sea level. Curves and photographs are included. In German.

PB 39512. SCHNEIDER, KURT. *Beiträge zur Psychiatrie: Pathopsychologie der Gefühle und Triebe im Grundriss. Abnorme Erlebnisreaktionen. Psychischer Befund und psychiatrische Diagnose.* (Contributions in the field of psychiatry. An outline-pathopsychology of feelings and instincts. Reactions of abnormal emotional experiences. Psychiatric status and psychiatric diagnosis.) 1946. 70 pp. Price: Microfilm, $2.00; Photostat, $5.00.

This booklet contains three papers of which only the second is new. The other two are slight revisions of earlier publications. Whereas in the first paper abnormal feelings and sensations are presented in general, the second contribution gives a special clinical pathopsychology of feeling. Numerous psychopathic and psychotic reactions are described in order to introduce and explain the technical terms. The third paper attempts to base the differential diagnosis of psychoses, especially that of schizophrenia and cyclothymia (manic-depressive psychosis), on the knowledge of pathopsychology.

PB 36484. CLAMANN. *Drucksturz-Versuche am Menschen. 1. Zwischenbericht: Drucksturzselbstversuche ohne Sauerstoff.* (Abrupt drop of pressure. Tests on man. 1. Intermediate report. Tests involving abrupt drop of pressure without oxygen.) (*Deutsche Luftfahrtforschung FB 1096.*) September, 1939. 10 pp. Price: Microfilm, $1.00; Photostat, $1.00.

This German report from the *"Luftfahrtmedizinisches Forschungs Institut des Reichsluftfahrtministeriums"* discusses the physiological effects of an abrupt drop in pressure on the human organism on the basis of tests carried out in an altitude test chamber. It was found that oxygen deficiency plays the decisive part, while the effects of the pressure drop *per se* are secondary. A table and several graphs are included.

PB 36448. COERMANN. *Ein elektrisches Gerät zur Bestimmung der oberen Hörgrenze.* (An electrical instrument for determining the upper limit of audibility.) (*Deutsche Luftfahrtforschung* FB 1337.) December, 1940. 25 pp. Price: Microfilm, $1.00; Photostat, $2.00.

This report from the *"Deutsche Versuchsanstalt für Luftfahrt, E.V."* described the development of a new electro-acoustic instrument (monochord) for determining the upper limit of sound—an instrument suitable for use by otologists and altitude physiologists. It also illustrates by a graph the effect of oxygen deficiency on the upper limit of audibility. Photographs, diagrams and graphs are included.

PB 37299. COERMANN, R. *Lärmeinwirkung im Flugzeug.* (Influence of noise in aircraft.) (*Deutsche Luftfahrtforschung FB 1102.*) September, 1939. 64 pp. Price: Microfilm, $2.00; Photostat, $5.00.

This report of the *"Deutsche Versuchsanstalt für Luftfahrt, E.V."* is concerned with the effect of aircraft noise on the physical and psychological operational efficiency of aircraft personnel. Known physiological reactions have been summarized and the reduction in labour efficiency because of the influence of noise is indicated. Directions are given

[1] Supplied by the Information Service of the Council for Scientific and Industrial Research.

for the prevention of noise injuries and for further research of the noise problem. Data tables, photographs, graphs and charts are included. In German.

PB 36423. FREITAG. *Über die Einwirkung der Kälte auf das Zahnsystem.* (On the effect of cold on the teeth.) (*Deutsche Luftfahrtforschung* FB 1515.) November, 1941. 15 pp. Price: Microfilm, $1.00; Photostat, $1.00.

This is a report of the *"Deutsche Versuchsanstalt für Luftfahrt, E.V., Berlin-Adlershof"*. This study describes experiments which were performed in order to explain the effect of the temperatures arising in altitude flights on the teeth, especially fillings. The results of experiments on the flying personnel of the German air force are presented and the experimental studies in the cold chamber are discussed. The conclusions drawn from the studies show that cold is not the only cause of the damage observed. Drawing and photograph are included.

PB 23581. JEGLINSKY, H. *Über das Vitamin A.* (Vitamin *A.*) (ALSOS Kliewe T 2 B.) February, 1943. 7 pp. Price: Microfilm, 50c.; Photostat, $1.00.

The present report is an abstract of a lecture delivered at the *"Militärärztliche Akademie, Institut für Wehrpharmacie und angewandte Chemie"* in February, 1943, in which a staff chemist reviewed the history of research on vitamin *A*, and discussed its occurrence, biology, pharmacology and toxicology, with special reference to clinical manifestations and treatment of *A* hypervitaminosis and hypovitaminosis. Many references to periodical literature on the various aspects of vitamin *A* research are included.

PB 23273. KAISER WILHELM INSTITUT FÜR ARBEITSPHYSIOLOGIE, DORTMUND. *Arbeitsprogramm des Institutes.* (Programme of activities, organization and personnel of the institute.) July, 1945. 12 pp. Price: Microfilm, 50c.; Photostat, $1.00.

An ambitious, comprehensive programme is outlined, including experimental and observational studies based on calorimetry, diet experiments, studies of relation of nutrition to type of work, chemistry of muscle, study of sensory motor coordination *et cetera*, and statistical and observational treatment of influence of age, sex, environment (including temperature, humidity *et cetera*), stimulants, working space, and psychobiotic factors, on human efficiency. This review is presented in connexion with a petition to the Occupation Army for permission to continue the work of the institute. Partly in German.

PB 23586. MEHLER. *Physiologisch-chemische Untersuchungen.* (Chemico-physiological investigations.) ALSOS Kliewe T 2 B.) February, 1943. 20 pp. Price: Microfilm, 50c.; Photostat, $2.00.

In this lecture, delivered before the *"Militärärztliche Akademie, Institut für Wehrpharmazie und angewandte Chemie"* in February, 1943, the author discusses the diagnostic significance of chemico-physiological tests of blood and urine in various diseases, and then describes briefly the technique of carrying out such tests for blood and urine diastase, albumin in the urine, blood and urine sugar *et cetera*.

PB 36663. RUFF, S. *Untersuchungen über die Erkennung von den in der Fliegerei verwendeten farbigen Signallichtern durch Farbenuntüchtige (Deutsche Luftfahrtforschung FB 1232).* June, 1940. 23 pp. Price: Microfilm, $1.00; Photostat, $2.00.

(Investigations relating to the recognition by colour-blind individuals of the coloured signal lights used in aviation.) This report from the *"Deutsche Versuchsanstalt für Luftfahrt, E.V."* discusses and gives the results of tests on individuals afflicted with deuteranopia, protanopia *et cetera*, and proposes changes to be made in the aeronautical signal systems. Diagrams, photographs, tables and a bibliography are included.

PB 37285. SCHÜTZE. *Untersuchungen über den Einfluss verschiedener Zuckerarten auf die höhen festigkeit, insbesondere bei Arbeit. (Tests on the influence of various forms of* sugar on altitude resistance, especially while at work.) (*Deutsche Luftfahrtforschung* FB 1206.) April, 1940. 12 pp. *Price: Microfilm, $1.00; Photostat, $1.00.*

This report of the *"Deutsche Versuchsanstalt für Luftfahrt"* describes work tests at low pressures to determine whether the dispensing of various forms of sugar in a quantity ratio to body weight can increase the altitude resistance, in comparison with similar tests with persons having a normal diet. The behaviour of the patellar tendon was used for the tests. Conclusions are drawn as to the effect of the use of sugar on the altitude resistance of flight crews. Photographs, data table and graphs are included. In German.

PB 37638. WIESEHÖFER. *Über Flugversuche zur Frage der Erträglichkeit höher Beschleunigungen bei liegender Unterbringung der Flugzeuginsassen.* (On flight tests to determine the question of the bearableness of great acceleration with the prone quartering of aircraft occupants.) (*Deutsche Luftfahrtforschung* FB 1075.) June, 1939. 23 pp. *Price: Microfilm,* $1.00; Photostat, $2.00.

This report of the *"Deutsche Versuchsanstalt für Luftfahrt, E.V."* presents a short summary and critical analysis of results to date including data on tests to determine the centrifugal influence on the back and chest. The possible effect of the result on aircraft design is indicated. Diagrams, photographs, graphs and sketches are included. In German.

PB 36547. ROMBERG AND SCHWEPPER. *Untersuchung über den Einfluss der Sauerstoffatmung auf die alveoläre CO_2 Spannung im Unterdruck.* (Investigations about the influence of oxygen respiration on alveolar CO_2 tension in subpressures.) (*Deutsche Luftfahrtforschung* FB 1440.) July, 1941. 18 pp. Price: Microfilm, $1.00; Photostat, $2.00.

Subpressure chamber tests determined the influence of prolonged oxygen respiration at 7,500 metre altitude in regard to alveolar CO_2 tension. In order to control circulation, pulse and blood pressure are measured. A time reserve test is compared with a normal time reserve experiment. Besides a decrease after climb, no unusual reaction of the oxygen respiration with regard to alveolar CO_2 tension can be observed. Pulse and blood pressure are within normal limits. One diagram and table of data are included.

PB 37174. OPITZ, E. *Über den Sauerstoffvorrat des Menschen nach Unterbrechung der Sauerstoffatmung in grossen Höhen.* (The oxygen supply of a human being after interruption of oxygen respiration in high altitudes.) *Deutsche Luftfahrtforschung* FB 1162.) No date. 13 pp. Price: Microfilm, $1.00; Photostat, $1.00.

The undesirable decrease of blood oxygen can be prevented by stopping respiration for several minutes. The higher the altitude, the shorter will be the time of decrease of the oxygen content of arterial blood. The decrease of oxygen in the air of the lungs and blood is accelerated by breathing activity. After deep respiration the lungs carry a great amount of oxygen which covers the oxygen supply for a few minutes. In case of abandoning the oxygen apparatus during high-altitude flying it is advisable to stop breathing in a deep respiratory position in order not to let oxygen escape. On the other hand, if the oxygen supply should be interrupted it is of utmost importance to get another apparatus or decrease the altitude. Graphs.

PB 23301. FRINGS, HUBERT, AND O'NEAL, BONNIE R. The loci and thresholds of contact chemoreceptors in females of the horsefly, *Tabanus sulcifrons* Macq. No date. 23 pp. Price: Microfilm, 50c.; Photostat, $2.00.

In studies made at the Medical Research Laboratory, Edgewood Arsenal, Maryland, contact chemoreceptors of female horseflies were located by touching parts of the bodies of the flies with needles dipped in 1M sucrose solution, the dropping of the proboscis being the index of reception. The receptors are medium-sized hairs near the margin of the labella and the tarsal segments. The mean acceptance thresholds for sucrose solution were: 0·060M for the tarsi and 0·021M for the labella. The insects refused to lower the proboscis when the tarsi were stimulated by a 0·2M sucrose solution to which electrolytes were added in sufficient concentrations. Rejection thresholds were determined for several electrolytes, and the order of thresholds was found to be similar to that for other insects. The acceptance threshold for sucrose and rejection threshold for NH_4Cl showed no definite changes during starvation. Tables are given showing thresholds of response to sucrose after inanition, and tarsal thresholds for sucrose and NH_4Cl at various intervals during starvation. A bibliography accompanies the article.

PB 40493. BERG, W. E., *et alii.* Explosive decompression: Lung damage correlated with the respiratory cycle in explosive decompression. (National Research Council Committee on Aviation Medicine Report 173.) August, 1943. 7 pp. Price: Microfilm, $1.00; Photostat, $1.00.

These experiments were carried out to determine accurately what relationship existed between the phases of respiration and the amount of lung damage produced by explosive decompression. The respiration of individual rats was photographically recorded by a string galvanometer in conjunction with sensitive thermocouples which gave electrical variations due to the difference in temperature between inspired and expired air. Explosive decompression produced a sudden deflection of the string which was caused by the rapid expiration of expanded air from the lungs. This served to place accurately the time of the decompression in the respiratory cycle. All rats were explosively decompressed from ground level to 40,000 feet in approximately 0·02 second. They were breathing 100% oxygen and were returned to ground level in about thirty seconds. Lung damage occurred throughout inspiration and during the first third of expiration. Slight to no damage was found during the last two-thirds of expiration. A period of apnœa always followed the decompression. A table, graphs and photographs of testing equipment are included. This work was performed under contract with the University of Southern California, the National Research Council acting for the Committee on Medical Research, OSRD. See also PB 40492, reported under Paul O. Greeley.

British Medical Association News.

ANNUAL MEETING.

THE annual meeting of the Western Australian Branch of the British Medical Association was held at the Royal Perth Hospital on March 19, 1947, DR. L. E. LE SOUEF, the President, in the chair.

The Australasian Medical Congress (British Medical Association).

By permission of the meeting Dr. D. M. McWhae, the president-elect of the sixth session of the Australasian Medical Congress (British Medical Association) to be held at Perth in August, 1948, addressed the members and moved the following motions, all of which were seconded by Dr. L. E. Le Souef and carried.

That all members of this Branch of the British Medical Association form a General Congress Committee.

That a Congress Executive Committee be formed consisting of President, Honorary Secretaries and Treasurer; *ex officio*, the two Federal Council Representatives with power to add to their number; the President, Vice-President and General Secretary of the Federal Council and the Editor of THE MEDICAL JOURNAL OF AUSTRALIA shall be *ex officio* members of the Executive Committee of Congress. This Committee to be subject to the authority of the General Committee and to forward to it progress reports through the usual channels; also that the Executive Committee be empowered to form any additional Committees necessary for the organization of Congress provided they be not inconsistent with any Committees elected by the General Congress Committee.

I wish to propose the following office bearers: Honorary General Secretary, Dr. G. B. G. Maitland; Assistant Honorary General Secretaries, Dr. L. G. Male and Dr. H. M. Trethowan; Treasurer, Dr. H. Macmillan.

Financial Statement.

The Honorary Treasurer's report and balance sheet was received and adopted on the motion of Dr. F. Gill, seconded by Dr. J. H. Young.

Library Report.

The library report was received and adopted on the motion of Dr. G. A. Murray, seconded by Dr. B. C. Cohen. Dr. J. P. Ainslie moved that the appreciation of members for the valuable work done by Miss Bryan in the library should be recorded in the minutes. This was seconded by Dr. H. S. Lucraft and carried unanimously. In the course of his remarks Dr. Lucraft suggested that each member of the Branch should add a codicil to his will leaving the sum of £100 to the library

Medical Benevolent Fund.

The report and balance sheet of the Medical Benevolent Fund was received and adopted on the motion of Dr. H. S. Lucraft, seconded by Dr. D. E. Copping.

Report of the Council.

The annual report of the Council was read by the honorary secretary and was received and adopted on the motion of Dr. H. S. Lucraft, seconded by Dr. F. Gill. The report is as follows.

The Council has pleasure in presenting the following report of the work of the Branch for the past twelve months.

Membership.

The membership of the Branch is 382, which includes junior resident medical officers and retired members of the medical profession.

Obituary.

The Branch has sustained a loss by death of the following members: Dr. A. T. White, Dr. Donald Smith and Dr. Dodwell Browne.

Honours Conferred.

Information has been received of the following honours conferred upon members of the Branch for war service: Brigadier G. B. G. Maitland, C.B.E., E.D.; Lieutenant-Colonel L. E. Le Souef, O.B.E., Mentioned in Dispatches, *Médaille d'honneur* of the Military Medical Services of France; Major B. A. Hunt, M.B.E.; Major B. W. Nairn, *M.B.E.; Captain T. Godlee, M.B.E.; Major C. R. Dunkley*, Mentioned in Dispatches; Major Alan King, Mentioned in Dispatches; Captain C. L. Anderson, Mentioned in Dispatches; *Captain F. E. Gallash, Mentioned in Dispatches;* Captain Max Mayrhofer, Mentioned in Dispatches.

Meetings.

In addition to the annual meeting there were eight general meetings of the Branch held during the year, including three clinical meetings. At the remaining five papers were given as follows: "Costen's Syndrome", by Mr. J. C. R. Bell, Dip.D.S.; "On the Burma-Siam Railway", by Dr. Bruce Hunt, supported by Dr. Claude Anderson; "Rehabilitation: A Challenge", by Dr. L. E. Le Souef; "Some X-Ray Studies of the Human Female Pelvis", by Professor William W. Greulich.

Dr. John Hunter addressed a meeting on the conditions in England regarding the national medical service.

Council.

Nineteen Council meetings were held. The record of attendance of the Council is as follows:

Dr. L. E. Le Souef (President)	18
Dr. H. H. Stewart (Vice-President)	16
Dr. R. D. McKellar Hall (Honorary Secretary)	15
Dr. G. A. Murray (Honorary Treasurer)	10
Dr. A. A. Merritt (Assistant Honorary Secretary)	19
Dr. J. P. Ainslie (Councillor)	16
Dr. F. W. Carter (Federal Council Representative)	17
Dr. H. L. Cook (Councillor)	14
Dr. C. E. Cook (Commissioner of Public Health)	13
Dr. D. E. Copping (Councillor)	14
Dr. O. R. Corr (Councillor)	16
Dr. C. R. Dunkley (Councillor)	13
Dr. S. E. Craig (Past President)	12
Dr. N. M. Cuthbert (Federal Council Representative)	15
Dr. H. M. Trethowan (Chairman of Convocation)	15

Office Bearers and Councillors.

The following office bearers were elected by the Council: Dr. R. D. McKellar Hall, President; Dr. N. H. Robinson, Honorary Secretary; Dr. H. H. Stewart was reelected Vice-President; Dr. G. A. Murray was reelected Honorary Treasurer; Dr. A. A. Merritt was reelected Assistant Honorary Secretary and Honorary Secretary of Convocation; Dr. H. M. Trethowan was reelected Chairman of Convocation; Dr. F. W. Carter and Dr. N. M. Cuthbert were reelected as Branch representatives on the Federal Council; Dr. J. P. Ainslie, Dr. H. Leigh Cook and Dr. D. E. Copping were reelected members of Council; Dr. S. E. Craig and Dr. B. A. Hunt were elected.

Entertainments.

A welcome home dinner was held at the Adelphi Hotel for the returned prisoners of war. This was attended by approximately eighty members and several visitors from the eastern States, including Major-General S. R. Burston, C.B.E., D.S.O., V.D., Air Vice-Marshal T. E. V. Hurley, C.M.G., V.D., and Dr. Kenneth Smith, C.M.G., Principal Medical Officer of the Repatriation Commission.

Dinners were arranged by the Council to entertain Professor Peter McCallum, Dr. Metcalfe and Dr. John Hunter from the eastern States and also Professor W. Greulich from America.

Medical School.

Professor Peter McCallum, Professor of Pathology of the University of Melbourne, came to Western Australia in 1946 to investigate for the State Government the needs of Western Australia in regard to a medical school. A report has recently been received in which he recommends that a school be established as soon as possible. The Commonwealth Government has made available £125,000 towards the building of the school, but the State Government has not yet given any indication of its intentions. Despite this it is hoped that the school will be an established fact by 1949. The chances that the school could open in 1948 would seem very remote.

Federal Council.

The very strenuous work carried out by our representatives, Dr. F. W. Carter and Dr. N. M. Cuthbert, is acknowledged with great pleasure. There have been two meetings of the Federal Council during the past twelve months which have necessitated considerable travelling and

time on the part of these two members. It is hard for members outside the Council to realize what a real debt we owe them, and we take this opportunity of thanking them publicly on behalf of all members of the Association.

During the year Dr. Carter resigned from the Federal Contract Practice Committee, and his place has been ably taken by Dr. H. Leigh Cook.

Australasian Medical Congress.

The invitation of this Branch to the Federal Council to hold its first post-war medical congress in Perth has been accepted. Dr. D. M. McWhae, C.M.G., C.B.E., V.D., has been chosen as the President-elect by the Federal Council and the organization is being quickly arranged so that the congress may take place in the August-September, 1948, vacation of the University of Western Australia.

Protection of Practices.

This fund is well established and has done a considerable amount to assist returned men to reestablish themselves in civilian practice, and we would like to thank the trustees and the secretary of this fund for the unstinting work they have done.

Permanent Post-Graduate Committee.

This committee, recently known as the Rehabilitation and Post-Graduate Subcommittee, has been reconstituted, but is continuing to deal with rehabilitation matters. They are arranging courses for those members who wish to take refreshers at the various hospitals and at the university, and it is also hoped that in 1947 there will be visiting lecturers from the United Kingdom and the United States of America.

Dr. R. W. Johnson was appointed Executive Officer of the Rehabilitation and Post-Graduate Subcommittee and was also State Director of Post-Graduate Training and gave excellent service to ex-servicemen.

National Medical Service.

This question has been the subject of much discussion and several speciai meetings have been held to go into the question. At the present time the matter is more or less in abeyance pending some move by the Government to allow the medical profession to get some idea of the governmental trend in the matter. In Great Britain the bill for the socialization of medicine has gone through Parliament, and although there was considerable opposition by the medical profession, they were not strong enough to overrule on this question; they did, however, obtain many alterations which will improve conditions generally. Dr. John Hunter very kindly gave an address on his trip to England and what he learnt there to members at a general meeting in September, all of which has been previously published, in outline at least, in THE MEDICAL JOURNAL OF AUSTRALIA.

Convocation.

There have been three meetings of convocation during the past twelve months, held in May, August and January. These were well attended, a majority of country groups being represented. All matters concerning the profession generally were discussed and some new ideas concerning present-day problems were brought forward.

War Casualties.

This State appears to have been more fortunate than others in that so far as can be ascertained, no Western Australian medical officers lost their lives as a result of enemy action, or of sickness contracted whilst serving in the armed forces.

Repatriation Commission.

This Branch gave evidence before the Special Advisory Committee, Medical Services of the Repatriation Commission, on August 16, 1946.

Hospitals.

Hospital Benefits Act, 1945.—A deputation waited on the Premier, who was attended by the Minister for Health, concerning the effect of the abolition of the means test on medical treatment. Following further discussions on this matter, in which all members of the Branch were given an opportunity of expressing their opinions to convocation, it was decided that this Branch was in favour of the continuance of the honorary system, and it is hoped that this will overcome the hospital impasse caused by the Federal Government, in collaboration with the State Governments, passing this legislation without any practical consideration being shown for the practising medical profession. It is to be noted that the practising medical profession was quite ignored by the Government in power.

Hospital Accommodation.—The Minister for Health was approached in deputation in an endeavour to improve the present hospital situation in the State. While the shortage of accommodation in hospitals is to be found elsewhere, suggestions were made which might help to alleviate the position.

The importance of establishing community hospitals was strongly urged as well as the necessity for improving the conditions for the nurses working in these hospitals.

Contract Practice.

All aspects of contract practice have been closely watched and the thanks of the profession generally are due to the chairman and members of this subcommittee. It has been stressed to members that they must support in every way this subcommittee or else almost of necessity they will lose, either for themselves or their colleagues succeeding them, the improvement in conditions of service which have been laboriously obtained through this subcommittee.

Library.

It is desired to place on record the indebtedness of the profession to Miss Bryan, who has, under difficulties of space, maintained a most efficient and outstanding library service for members.

Conclusion.

The Council has dealt with a large volume of business and has been gratified by the smooth working of convocation through which it has been possible to bring a realization to all members that their interests are being safeguarded in the best possible manner.

There would appear to be an increased interest among members, and this is in very great part due to the dissemination of information back to them from Council through their groups of convocation. Whilst the medico-political work has not been excessive in 1946, members will be much better fitted to cope with the almost certain increase of medico-political activity in the future. The fact that members feel that they have now more voice in the affairs of their own Association should be a great point to strengthen them in their unity when the testing time comes.

Practically all members have returned from the services to take up their civilian positions again. The rehabilitation of these members is a most important feature of our post-war reconstruction and would appear to be taking place smoothly.

Our thanks are due to our lay part-time secretary and his staff who have given unstinted and most loyal service to the Branch.

Election of Office Bearers.

The following were elected office bearers for the ensuing year:

President: Dr. R. D. McKellar Hall.
Vice-President: Dr. H. H. Stewart.
Honorary Secretary: Dr. N. H. Robinson.
Honorary Treasurer: Dr. G. A. Murray.
Assistant Honorary Secretary: Dr. A. A. Merritt.
Members of Council: Dr. J. P. Ainslie, Dr. Leigh Cook, Dr. D. E. Copping, Dr. S. E. Craig, Dr. B. A. Hunt.

Induction of President.

Dr. L. E. Le Souef then vacated the chair in favour of the new President, Dr. R. D. McKellar Hall, who thanked them for the honour they had done him and paid a tribute to the work of Dr. L. E. Le Souef during the previous twelve months.

Retirement of Dr. R. D. McKellar Hall from the Secretaryship.

Dr. N. M. Cuthbert referred to the retirement of Dr. R. D. McKellar Hall from the secretaryship, a position which he had occupied with distinction for six years. He moved that the Branch should place on record its appreciation of Dr. McKellar Hall's services. The motion was seconded by Dr. H. S. Lucraft and carried.

British Medical Agency Company of Western Australia, Limited.

Dr. J. P. Ainslie reminded members of the advantage of conducting all their insurance business through the British Medical Agency Company of Western Australia, Limited. He appealed to members taking out new insurance policies to make use of the agency and thus to aid the funds of the Branch indirectly.

XUM

Medical Benevolent Association.

Dr. J. J. Holland tendered his resignation as a trustee of the Medical Benevolent Association. On the motion of Dr. L. E. Le Souef, seconded by Dr. J. P. Ainslie, it was resolved that Dr. Holland's resignation should be accepted with regret and that a letter should be sent to him expressing appreciation of his long services. Dr. B. C. Cohen was appointed trustee in place of Dr. Holland.

NOTICE.

THE General Secretary of the Federal Council of the British Medical Association in Australia has announced that the following medical practitioners have been released from full-time duty with His Majesty's Forces and have resumed civil practice as from the dates mentioned:

Dr. S. Goulston, 231, Macquarie Street (June 1, 1947).
Dr. M. Joseph, 231, Macquarie Street (June 2, 1947).

Post-Graduate Work.

THE MELBOURNE PERMANENT POST-GRADUATE COMMITTEE.

THE Melbourne Permanent Post-Graduate Committee announces the following programme for July.

Diagnostic Radiology.

A course in diagnostic radiology for Part II of the Diploma of Diagnostic Radiology is to be conducted at 4.30 o'clock p.m. on each Monday and Wednesday from July 16 to September 3. The fee is £8 8s., and enrolments may be made with the Melbourne Permanent Post-Graduate Committee, College of Surgeons, Spring Street, Melbourne.

Courses for Higher Degrees and Diplomas.

Courses for higher degrees and diplomas, Part I, are being conducted at the University of Melbourne. Neurology demonstrations for M.D. examination, Part II, are being continued.

Late Afternoon Course in Neurology.

A course in clinical neurology, suitable for general practitioners, will be continued by Dr. E. Graeme Robertson on July 3, 10 and 17 at the Royal Melbourne Hospital.

Country Course.

On July 16, at 8.15 o'clock p.m. at the Geelong Hospital, Dr. L. B. Cox will conduct a demonstration on "Turns". The lecture which Dr. Fitts was to have conducted will be given later. The fee for attendance is 10s. 6d. per demonstration, payable to Dr. D. A. Kidd, secretary of the Geelong Subdivision of the Victorian Branch of the British Medical Association, 216, High Street, Belmont, Geelong. Telephone 2857. Those enrolled under the Commonwealth Reconstruction Training Scheme may attend the course under this scheme.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Courses.

THE Post-Graduate Committee in Medicine in the University of Sydney announces that the following courses are at present in progress: course for general practitioners and course in advanced medicine suitable for M.R.A.C.P. candidates; courses for the diplomas in anæsthesia, dermatology, Part II, psychological medicine, Parts I and II, diagnostic radiology and therapeutic radiology. During July a course for the diploma in clinical pathology will begin and be continued for approximately six months.

On September 1 courses for Parts I of the degree of Master of Surgery and diplomas in gynæcology and obstetrics, laryngology and oto-rhinology and ophthalmology will begin. All courses are open to medical practitioners and early application is necessary. The committee reserves the right to limit the number of enrolments in any course.

An advanced course for specialists in gynæcology and obstetrics will be conducted at the King George V Memorial Hospital from September 1 to 12. One week of this course will be devoted to gynæcology and one week to obstetrics, and post-graduates are limited to twelve. Early application for this course is therefore essential.

Annual General Course.

Lectures.—Sir Gordon Gordon-Taylor, K.B.E., C.B., F.R.C.S., will deliver the following two lectures at the Stawell Hall, 145, Macquarie Street, Sydney, at 8.15 o'clock p.m. on Friday, June 20, and Tuesday, June 24, 1947: "Some Aspects of Cancer Surgery" and "Bad Surgical Risks". These lectures form part of the annual general course conducted by the committee, the subscription to which is £1 1s. *per annum*. On this occasion, however, all practitioners are being invited to be present at these lectures without fee.

Film Programme.—The following medical films will be shown at the Stawell Hall, 145, Macquarie Street, Sydney, at 4.30 o'clock p.m. on Wednesday, June 18, 1947: "Skeletal Fixation by the Stader Splint—Fractures of the Tibia", "Skeletal Fixation by the Stader Splint—Fractures of the Os Calcis", "Analysis of Muscle Function in Poliomyelitis".

Details of all courses may be obtained on application to the Course Secretary, Post-Graduate Committee in Medicine, 131, Macquarie Street, Sydney. Telephones: BW 7483, B 4606.

Medical Matters in Parliament.

QUESTIONS IN THE HOUSE OF REPRESENTATIVES.

The Commonwealth Tuberculosis Grant.

ON May 15, 1947, in the House of Representatives, Mr. J. Francis asked the Minister representing the Minister for Health, upon notice, what was the reason for the non-participation by Queensland in the grant of £50,000 for each State under the *Tuberculosis Act*.

The Honourable E. J. Holloway replied that the Minister for Health had supplied the following information.

> Under the *Tuberculosis Act*, 1945-1946, the Commonwealth has made available to the States the sum of £100,000 *per annum* on pound for pound basis for the maintenance of diagnostic and after-care facilities. Up to the present time, Queensland has not applied for any payments under this section of the act. The sum of £250,000 *per annum* has also been allocated to the States under the act for distribution by the States amongst approved sufferers of tuberculosis. It was agreed to implement payments under the grant according to a uniform procedure decided at a conference of Commonwealth and State officers held at Canberra on December 18, 1946. Queensland is the only State which has not applied for and been paid its proportion of the Commonwealth grant. It is entirely a matter for the Queensland Government to decide whether or not it makes application for its share of the grant which was £19,500 for the six months ending June 30, 1947.

Streptomycin.

The Right Honourable A. W. Fadden asked the Minister representing the Minister for Health, upon notice, the following questions:

1. Has the drug streptomycin recently been released from military control in the United States of America?
2. What supplies of streptomycin are available in Australia?
3. Does the Commonwealth Government intend to undertake production of the drug in Australia?
4. If not, will steps be taken to increase imports from America or other sources?
5. Has streptomycin recently been found to be an effective cure for miliary tuberculosis?
6. If so, will the Government make it available to tuberculosis sufferers in Australia?

The Honourable E. J. Holloway replied that the Minister for Health had supplied the following information:

1. Yes.
2. Quantities of the drug are being imported into Australia by commercial houses. Import licences have been granted this year for the import of at least 5,000 grammes.
3. Yes.
4. The importation of streptomycin at the present time depends entirely on the willingness of the com-

mercial producers in the United States of America to supply it.

5. Favourable results have been reported in a few cases of miliary tuberculosis by treatment with streptomycin, but it cannot be regarded as an effective cure in all cases.

6. Streptomycin will be included amongst the drugs to be submitted to the Pharmaceutical Formulary Committee for consideration for inclusion in the formulary under the *Pharmaceutical Benefits Act*.

Correspondence.

ANÆSTHESIA FOR UPPER ABDOMINAL SURGERY.

SIR: With reference to my paper, "Anæsthesia for Upper Abdominal Surgery", published in THE MEDICAL JOURNAL OF AUSTRALIA of March 22, 1947, in which it was stated in relation to curare, "I have found that as the potency of the drug varies it seems better to proceed with caution until the strength of the particular batch is known. It was found, for example, with the last batch of 'Tubarine' (Burroughs Wellcome) that approximately 12 milligrammes gave satisfactory relaxation for about forty-five minutes in the case of the average healthy adult, supplementary doses being two to four milligrammes", I would add that following discussion with Burroughs Wellcome and Company (Australia), Limited, I am satisfied that "Tubarine" is a stable preparation of constant potency.

Yours, etc.,

I. A. SCHALIT.

Newcastle Hospital,
Newcastle,
New South Wales.
May 20, 1947.

PATENT DUCTUS ARTERIOSUS.

SIR: On page 684 of your issue of May 31, 1947, Dr. Norman Cunningham states that at a meeting of the Melbourne Pædiatric Society which he recently attended, Dr. H. L. Stokes and myself showed three cases of patent *ductus arteriosus*, two of whom had been operated on and in one of whom the murmur had recurred.

The case shown which still had a murmur was that of a boy, aged nine, who was suffering from a patent *ductus arteriosus* who also had a patent interventricular septum. The presence of this combination was appreciated before operation, but we decided that his condition would be improved by occlusion of the patent *ductus arteriosus* and that was therefore done. The machinery murmur disappeared at the time of operation and has not returned. He still has a systolic murmur due to his patent interventricular septum.

I have operated upon seventeen cases with the object of closing a patent *ductus arteriosus*. In four of these a ductus was not found, three of them fell into the group of children with retarded development, and, although we felt that it was quite likely that they were suffering from a patent interventricular septum and not a ductus, the signs were somewhat equivocal and we deliberately elected to perform a thoracotomy in the hope that a ductus would be found and could be ligated. The fourth case presented a classical syndrome of patent *ductus arteriosus* and no other diagnosis could possibly have been made. At operation no ductus was present and the thrill was felt to be maximum over the origin of the pulmonary artery, and we feel that this is probably an example of a leak through the aortic pulmonary septum just distal to the valves.

In thirteen cases a ductus was found and was occluded.

In the second case I operated on, the ductus was torn posteriorly and severe hæmorrhage resulted. Although the hæmorrhage was controlled, the patient died a few days after operation.

The remaining twelve cases survived operation, and in eleven of them the ductus has been satisfactorily obliterated. The murmur returned in the first case on which I operated, and in that case I was assisted by Major Paul Gebauer, of the United States Army, who had operated on a number of ductuses before he left the United States, and in one of his cases the patient developed an aneurysm through having had the ligature tied too tightly. As a result of this experience he was somewhat cautious in tying the ligature and depended on "Cellophane" placed round the ligated ducts to complete the occlusion, and in this case, as in another one that he operated on at the Royal Melbourne Hospital, the murmur has returned.

The method I have adopted is similar to that described by Blalock, in which a purse string is placed round the ductus at either end to occlude it and then several mattress sutures are passed through the lumen between the two purse-string sutures and produce very satisfactory occlusion over the total length of the ductus.

In one case I followed the technique of Gross and divided the ductus and sutured the end; this method makes recurrence completely impossible, but I feel that it is somewhat more hazardous than Blalock's technique, and as this in my hands has been completely satisfactory, I have generally adhered to it.

Two of my cases suffered from subacute bacterial endocarditis shortly before operation, but the infection was controlled by penicillin.

Whilst I would agree with Dr. Cunningham that the three conditions he mentioned are absolute indications for ligation of the ductus, I would go further and would advise ligation in any child with a patent *ductus arteriosus*.

I believe the risk of operation and its complications is very much less than the risk of possessing a patent ductus.

In adults, where the operative risk is likely to be a little higher, it may be reasonable to defer operation until some complication develops, but in my small series two of the adults were definitely reaching a stage where operation was imperative, and I have seen two others in whom I had to refuse operation because I was convinced that their condition had already passed the stage where operation would have been a reasonable procedure.

Yours, etc.,

C. J. OFFICER BROWN.

Victor Horsley Chambers,
12, Collins Street,
Melbourne.
June 4, 1947.

Obituary.

JACK MOWBRAY THOMSON.

DR. E. S. MEYERS has supplied the following additional appreciation of the late Dr. Jack Mowbray Thomson:

Although I did not meet Dr. Jack Thomson until 1915, his name and appearance were known to me much earlier than that. Both he and his father were the family doctors of a number of members of my family, from whose account of them I formed the opinion that both father and son were family doctors of the very best type. I remember hearing of young Dr. Jack and Dr. Jean (children of Dr. John Thomson). As a resident medical officer of Sydney Hospital, I had seen on the walls of the dining room a photograph of Dr. Jack Thomson among a group of residents. If memory serves me aright the late Dr. Harry Harris was also in this group.

Dr. Jack Thomson was not destined to enjoy the spacious social life of the late Victorian and Edwardian times into which he had been born and in which he passed his early life; for, after a few short years of private practice, the outbreak of war changed conditions of life completely, and he became a very overworked general practitioner and honorary out-patient surgeon on the staff of the Brisbane Hospital. I think it quite likely that overwork during this period contributed to the indifferent health which was his lot from those days onwards. History was to repeat itself for Dr. Thomson, for he became an equally overworked doctor during the Second World War when he relieved Dr. Gavin Cameron as government medical officer, a very onerous position, the responsibilities of which he carried out with singular devotion to duty.

The writer learned much about first aid from Dr. Thomson, whose experience in railway ambulance work was very great. It was an education to attend a field day at Narangbar as his assistant in adjudicating at the State finals in the annual railway ambulance competitions.

To many, Dr. Thomson appeared to be a cynic and a pessimist, though much of this was on the surface only, as his friends realized. Many of us enjoyed his dry humour at the morning cup of tea between operations, as with his varied experiences he had a fund of anecdote, much of which was related in a vein of satirical humour. His listeners thoroughly enjoyed these sessions. He was not of the type from which reformers and keen medical politicians spring; his sphere was the "daily round and common task" which he did uncommonly well. Though conservative, he was no mere obstructionist, as was well

shown some twenty-five years ago when a small group of young returned medical officers wished to lend respectability to their scheme of storming Brisbane's medical Olympian heights by establishing a medical school in Brisbane. Dr. Thomson was then the president of the recently formed Brisbane Hospital Clinical Society, and his aid was sought so that his executive might assist in persuading the British Medical Association to initiate a movement for the establishment of a department of anatomy and pathology in Brisbane. Dr. Thomson's reply was typical of him: "Of course you'll have no chance of success, but if it pleases you fellows to have this resolution passed by the Clinical Society we will pass it"—which the executive of the society did accordingly.

Dr. Thomson's hobby was his garden. He was a keen horticulturist, an inheritance, no doubt, from his father and grandfather, surgeon and naturalist. When I was preparing the notes for the Jackson Lecture last year, Dr. Thomson told me of his grandfather's relationship with Thomas Huxley and the famous H.M.S. "Rattlesnake".

In his devotion to duty and in his kindliness to his patients, Dr. Thomson showed an example that the younger generation of doctors would do well to emulate.

Vale, Jack Thomson!

LEONARD HARDWICK FOOTE.

WE regret to announce the death of Dr. Leonard Hardwick Foote, which occurred on June 5, 1947, at Brisbane.

Nominations and Elections.

THE undermentioned have applied for election as members of the New South Wales Branch of the British Medical Association:

Chandler, Roderick Peter, provisional registration, 1947 (Univ. Sydney), 49, Victoria Street, Roseville.

Lucas, Otto Nathan, registered in accordance with the provisions of Section 17 (B) of the *Medical Practitioners Act*, 1938-1945, 201, Macquarie Street, Sydney.

THE FEDERAL MEDICAL WAR RELIEF FUND.

THE following contributions to the Federal Medical War Relief Fund have been received:

New South Wales.

G. H. H. Gall, £50.
Robert Collin (New Zealand), £4 4s.
R. H. Kaines, H. Strauss, £3 3s.
R. B. Perkins, £2 2s.
Total: £62 12s.

Victoria.

A. G. Waterhouse, £25.
J. A. O'Brien (second contribution), F. Blois Lawton, £10 10s.
K. J. O'Day (second contribution), £10.
L. G. Travers, £8 8s.
H. G. Furnell (second contribution), £5 5s.
L. W. Johnston (second contribution), F. J. Colahan (second contribution), £4 4s.
George Cole (second contribution), £3 3s.
B. D. Vaughan (second contribution), £2 2s.
Alan J. Macdonald (second contribution), £1 1s.
Total: £84 7s.
Grand total: £19,295 7s. 6d.

Books Received.

"Principles and Practice of Obstetrics", by Joseph B. De Lee, M.D., and J. P. Greenhill, M.D.; Ninth Edition; 1947. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 10" × 7", pp. 1022, with many illustrations, some of them coloured. Price: 75s.

"*Die hormonalen Aspekte des Fortpflanzungsprozesses*", by Jules Samuels; 1946. Amsterdam: Holdert and Company N.V. 9¼" × 6¼", pp. 158.

"*Die Hormonversorgung des Fœtus*", by Jules Samuels; 1947. Leiden: E. J. Brill. 9¼" × 6", pp. 328.

"Diseases of the Retina", by Herman Elwyn, M.D.; 1946. London: J. and A. Churchill, Limited. 9¼" × 6", pp. 600, with many illustrations, some of them coloured. Price: 45s.

"A Short Textbook of Midwifery", by G. F. Gibberd, M.B., M.S. (London), F.R.C.S. (England), F.R.C.O.G.; Fourth Edition; 1947. London: J. and A. Churchill, Limited 8½" × 5½", pp. 572, with many illustrations. Price: 21s.

"Chemical Methods in Clinical Medicine: Their Application and Interpretation with Techniques of Simple Tests", by G. A. Harrison, B.A., M.D., B.Ch. (Cantab.), M.R.C.S. (England), L.R.C.P. (London), F.R.I.C.; Third Edition; 1947. London: J. and A. Churchill, Limited. 9¼" × 6", pp. 642, with illustrations, some of them coloured. Price: 40s.

Diary for the Month.

JUNE 24.—New South Wales Branch, B.M.A.: Ethics Committee.
JUNE 25.—Victorian Branch, B.M.A.: Council Meeting.
JUNE 25.—South Australian Branch, B.M.A.: Annual General Meeting.
JUNE 26.—New South Wales Branch, B.M.A.: Branch Meeting.
JUNE 27.—Queensland Branch, B.M.A.: Council Meeting.
JULY 1.—New South Wales Branch, B.M.A.: Council Quarterly Meeting.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Honorary Secretary, 135, Macquarie Street, Sydney): Australian Natives' Association; Ashfield and District United Friendly Societies' Dispensary; Balmain United Friendly Societies' Dispensary; Leichhardt and Petersham United Friendly Societies' Dispensary; Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney; North Sydney Friendly Societies' Dispensary Limited; People's Prudential Assurance Company Limited; Phœnix Mutual Provident Society.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federated Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225, Wickham Terrace, Brisbane, B.17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute; Brisbane City Council (Medical Officer of Health). Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178, North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205, Saint George's Terrace, Perth): Wiluna Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

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